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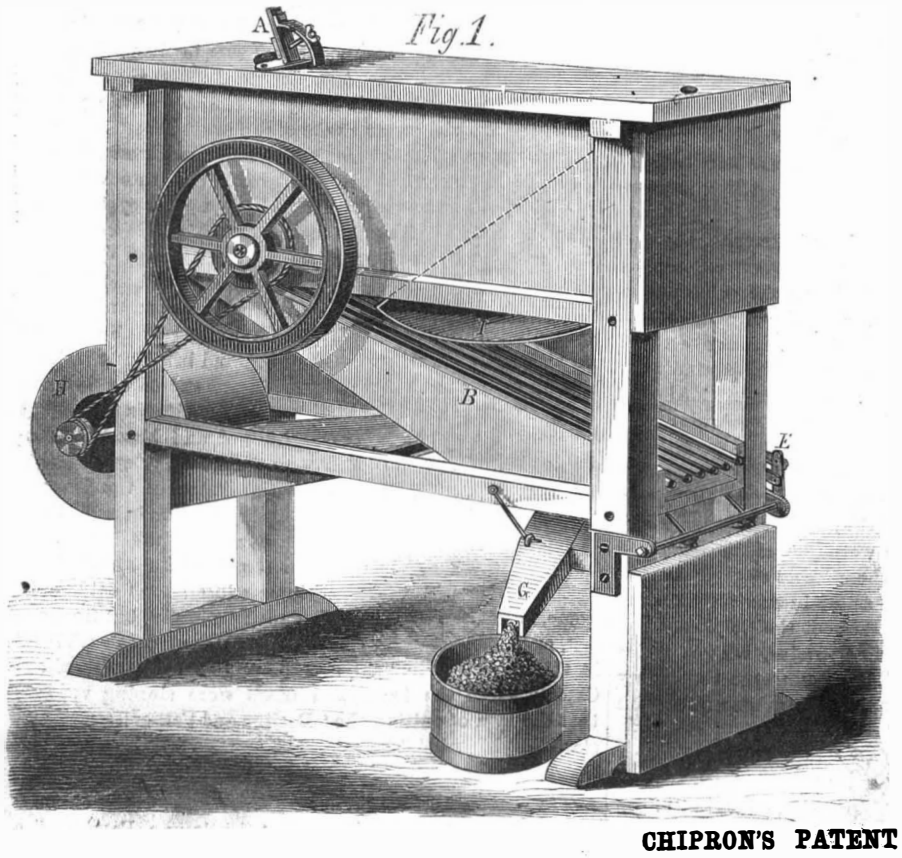
Improvement in Corn-Shelling Machines.

In this machine the ears of corn are fed into the sheller which, with the spout, A, is of ordinary construction, and is worked by suitable gearing from the driving shaft. B is a cradle furnished on the top with longitudinal bars placed at such a distance apart as to allow the corn to pass between the interstices, but not the cobs, which slide down into any receptacle placed for them. The corn kernels fall through on a sieve in the bottom of the cradle, the sieve being shown at

Fig. 1.



C, Fig. 2. The passage of the corn and the cobs is facilitated by a rapid oscillating motion imparted to the cradle, which is suspended by a rod at one end and is driven by a crank, connecting rod, and bell crank lever, seen at D E F, Fig. 2, and E, Fig. 1. The meshes of the sieve are of such a grade as to allow the broken kernels, dust, and other impurities to pass through, while the sound grain passes into a pan or receiver provided with a delivery spout, G. A blower, H, run at a rapid rate by belt from the driven shaft, D, forces a strong current of air up through the cradle, blowing away the dust and dirt from the corn. A shield or partition, seen in Fig. 1, by the dotted line, prevents the corn from being thrown out by the rapid oscillation of the cradle, and a curved shield, I, prevents the dust and dirt, after having been blown out, from again entering the cradle.

From the above it will be seen that in one operation this machine will separate the corn from the cob, and the sound grain from the imperfect, and from dirt and other impurities the corn being fanned perfectly clean, and left in condition for the market or mill, and delivered into a measure, sack, or other desired receptacle. It has taken the first premium at several Western fairs, and wherever used has given entire satisfaction. It may be driven by manual or any other power, as desired.

Patented through the Scientific American Patent Agency, Feb. 11, 1868, by P. C. Chripron, who may be addressed at Highland, Madison Co., Ill.

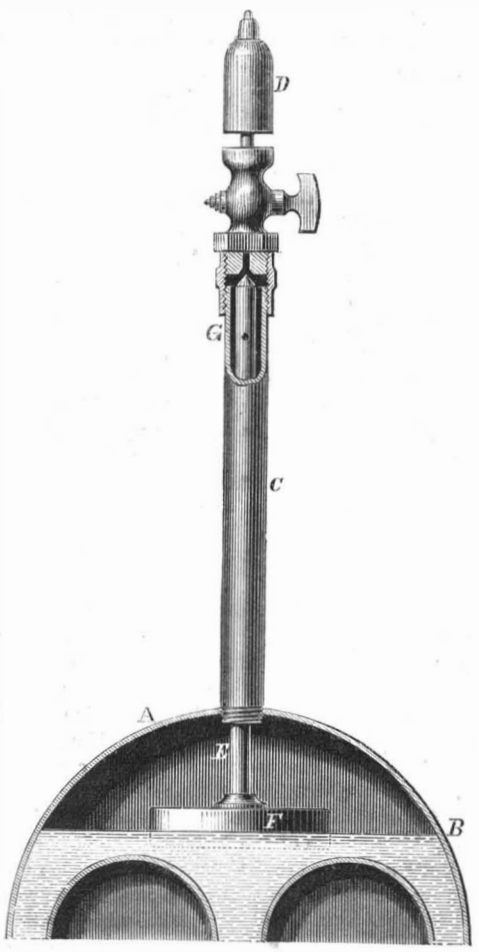
Iron and Chromium and Chromium Steel.

Iron and chromium may be alloyed in every proportion by heating the mixed oxides strongly under addition of charcoal powder, to effect reduction. Fremy formed an alloy by heating in a blast furnace oxide of chromium and metallic iron, thereby obtaining a product resembling cast iron. These alloys are generally hard, brittle, with a bright fracture, and crystalline in structure. When they contain a large percentage of chromium they crystallize in long needles. They are also less fusible, not as magnetic, no so easily attacked by acids as iron. The alloy of 95 per cent iron and 5 per cent chromium is stated to be hard, splitting under the hammer and scratching glass. The fracture is very bright, with crystalline plates extending across the fractured surface. The alloy of 75·2 per cent iron is readily reduced to powder, its fracture is tin white, finely granular and crystalline; that of 50·3 iron yields a somewhat spongy button with metallic globules; its fracture finely granular, bright and grayish white. The alloy of 25·3 per cent iron is obtained as an imperfectly fused spongy mass, of less coherence than the former, a yellowish-gray white color and somewhat dull luster. The alloy containing 17 per cent of chromium is described by Berthier as almost silver white, fibrous in structure, and with difficulty attacked by acids. That containing 60 per cent of chromium scratches glass better than tungsten steel, and almost as deeply as the diamond.

With regard to steel Berthier found that one or two per cent of chromium when added to molten metal communicates hardness and the property of taking a very beautiful damask, without diminishing its malleability. Faraday and Stodart examined steel containing nearly three per cent of chromium, and found it to be as malleable as pure iron and giving a very fine damask. The damask was removed by polishing and restored by heat without the use of any acid.

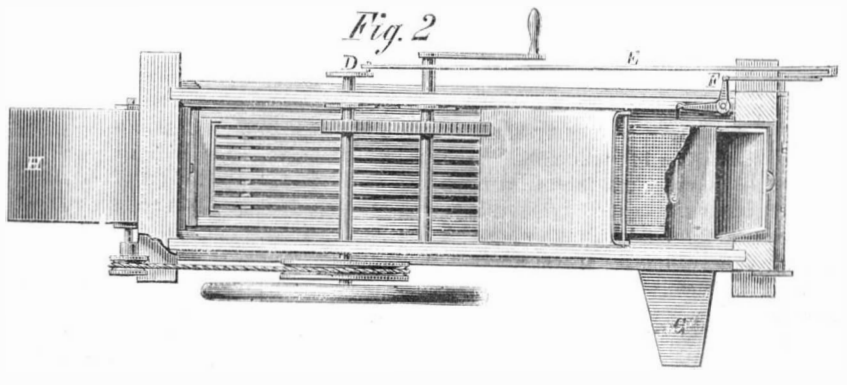
DAVENPORT'S PATENT LOW WATER ALARM.

Quite a number of low water detecters for steam boilers are in use, and some of them work well when new and properly attached; but others are either so complicated in their mechanism or so influenced by unseen contingencies that they, in time, prove unreliable. The one herewith illustrated and described appears, however, to be so simple in construction and direct in action that it commends itself to the attention of the engineer.



The upper portion of the engraving represents a vertical central section of the instrument, showing its internal arrangement. A represents the shell of the boiler, B is the water line. C is a tube which is screwed into the shell of the boiler on the top end of which there is a steam whistle, D, as shown in the engraving. The lower part of the aperture in this whistle is countersunk and forms a seat for a conical valve. E is an interior tube which passes down into the boiler where it is attached to a float, F, which rests upon the surface of the water as seen. The tube, E, is about three eighths of an inch smaller in external diameter than the bore of tube, C, so that the steam may escape up through the annular space between the two. Steam is admitted to the interior of the float by a small orifice, G, near the upper end of the tube, E, for the purpose of producing an equilibrium of pressure on the float to prevent its collapsing. The top of tube, E, is closed and forms a conical valve which fits the seat in the lower part of the whistle. By these details it will be seen that when the water in the boiler is at the proper hight, the valve on the top of tube, E, will be lifted to its seat and close the aperture in the whistle, preventing the escape of steam, but when the water falls below the desired point the valve will be withdrawn and steam will escape to the whistle by the annular space between the two tubes and give the required alarm.

Fig. 2



CHIPRON'S PATENT CORN SHELLER.

When so required these alarms are fitted with a brass cap instead of a whistle, the alarm being given simply by the escape of steam through a small aperture; this arrangement is sometimes preferred where the noise of a whistle is objectionable. The whistles are also furnished with or without a stop cock, whichever way may be preferred. It will be seen that in this instrument there are no closely fitted parts, consequently it cannot stick, and that the working parts being so much above the water level, all obstruction on account of the accumulation of dirt is avoided, and perfect reliability of action insured.

Patented through the Scientific American Patent Agency January 7, 1868. The right to manufacture for the Eastern States is for sale. Letters for further information on the subject should be addressed to F. S. Davenport, Jerseyville, Ill.

Composition for Coating Wood, Iron, Paper, etc.

Patented by Antonio Pelletier, Washington, D. C.

I take the pulp of any fibrous matter, preferring that from bamboo, sugar cane, cornstalks, or other similar substances, prepared as for the making of paper, soapstone, or any mineral substance of a similar nature, and silicate of soda, in a liquid or any suitable state, in about equal quantities by weight, and thoroughly mix and incorporate the whole mass until it becomes soft and plastic. To this mixture, when desirable, a small quantity of red lead and litharge, in about equal proportions, may be added, the two together making about one eighth or one ninth of the whole mixture.

The composition thus made, with or without the red lead and litharge, or similar substances, while in its plastic state, I apply, with any suitable instrument, to the surface of any kind of wood, whether green or dry, or to the surface of paper, pasteboard, cloth, leather, brick, stone, or other fibrous or porous materials, which I desire to make water and fireproof, or to iron or other metal surfaces that I desire to protect from the action of fire. When this coating is about half dry, I treat it with coal or common tar. This tar may be either hot or cold. I prefer to use it hot, as it is then thinner and works easier. This tar may be applied with a brush or any other suitable instrument. Before it becomes dry, I cover it with as much powdered steatite, talc, or other similar "refractory substance," as it will hold, rubbing it well in with a roller or any suitable instrument. This done, the cement will be found completely water and fire-proof.

My composition I also make into sheets, of any size that may be desired, either for immediate use in the vicinity where made, or in convenient size for transportation, having made

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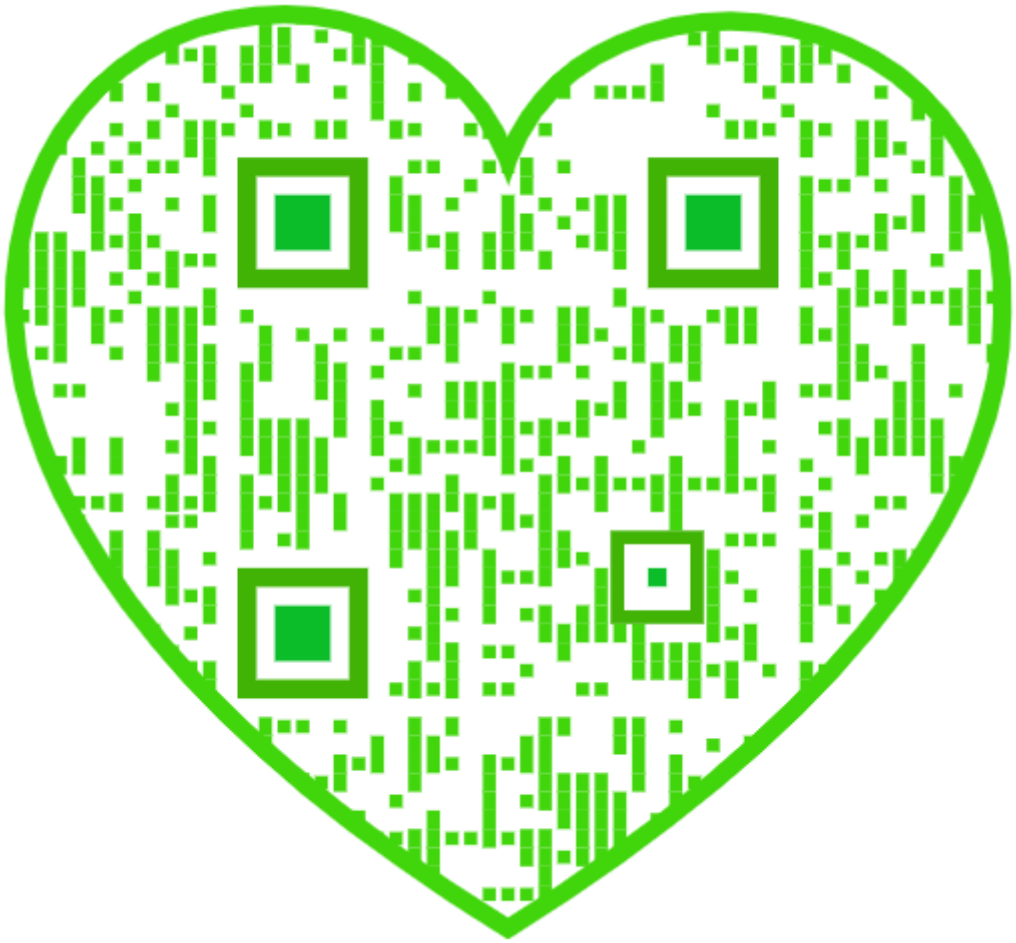

them fire and water-proof, as above described. In this form, my composition can be very conveniently used for roofing purposes of all kinds, whether for houses, railroad cars, locomotives, decks of steamboats, etc., etc., or for covering marine boilers, or lining wood or other surfaces exposed to the action of water or fire.

EDITORIAL CORRESPONDENCE.

Rome and its Ruins—How the People Subsist—Ancient Tombs and Columbaria—Burning the Dead—Modern Rome—Its Old Basilicas and Modern Churches—Interesting Facts in their History—St. Peter and St. Paul—The Divine Bambino—Monasteries—Novel Mode of Burying Monks—Lotteries—Carnival.

ROME, Feb. 19, 1868.

It is presumed that every one is familiar with the story of Romulus and Remus, but in these days, when old things pass away and all things become new so rapidly, it will not be amiss briefly to re-state the story by way of prelude to this letter.

One of the vestal virgins became the mother of twins by the god Mars, and as the result of her broken vow to live and die unmarried, her babes were doomed to be drowned in the river; but, in consequence of the overflow of the Tiber, the cradle in which the babes were placed was stranded at the foot of the Palatine hill. A she-wolf carried them into her den and suckled them, being assisted by a woodpecker, a bird sacred to Mars, who brought other kinds of food for their nourishment. A bronze figure of the she-wolf and sucklings is preserved as one of the most curious and precious antiquities of the Capitol Museum. The boys were afterwards recognized by their grandfather, and carried off to the Alban hills; but the impressions of their childhood were so strong, that they wanted to found a city on the Tiber. Differing as to the location, a quarrel arose between them, but finally it was agreed to submit the question to the gods. Romulus took the Palatine, Remus took the Aventine. Remus saw six vultures fly by, Romulus saw twelve. Each claimed the augury in his own favor; but the shepherd to whose decision it was submitted, decided in favor of Romulus, who yoked a bullock and heifer to a plow, and drew a furrow around the Palatine to mark his boundary.

Thus, according to popular tradition, Rome was founded, 750 years before the Christian era.

The Palatine is now covered by the immense ruins of the Palace of the Cesars, in part owned by the present Emperor Napoleon, who considers himself a modern Cesar, and is spending considerable money in trying to discover some grand memorials of this family, whose history is to ancient Rome what that of the Bonaparte family is to modern France. The result of these excavations thus far has been comparatively fruitless. Some say that Napoleon has bought the wrong end of the palace. But no matter, the digging will benefit some body.

At the birth of Christianity, Rome was an imperial city, numbering its millions, and swaying the destinies of the world. At the present moment, under the influence of Christianity, Rome contains about two hundred and fifty thousand people, who appear to exist in a sort of miraculous charity, which flows through all the mystic channels of communication with the millions of believers in the Old Church. And I must say that, as a general rule, the inhabitants were having a poor time of it, if one may judge by the hordes of idle people, dirty monks, and miserable beggars, and an entire absence of all that appears cheerful and even social among the the masses who throng the streets and public places.

Rome and its environs contain so much of interest that months might be employed in hunting about their ancient palaces and ruins, every fragment of which speaks a tale of the joys, sorrows, and destiny of our common humanity. I have wandered day after day on the Campagna, and along the Appian Way—one of the most striking vestiges of antiquity that remain to us, over which the conquering legion of the Cesars came from the East with their long train of captives, elephants, dromedaries, and other spoils of war. Here are to be seen giant masses of brick ruins covered by a growth of shrubs and rank weeds—also fragments of marble, base, column, cornice, and pediment—sculpture of heads, arms, trunks, legs and feet—of the long line of splendid tombs that once stood perfect, but now crumbling to dust on either side. Mounting upon the top of one of these monuments, and with glass in hand the eye takes in a wide sweep of country, dotted here and there with detachable portions of extensive aqueducts, grand temples, palaces, circuses, and other proud structures of the old city where the Gauls—

> "Entering at sunrise through her open gate,
> And through her streets, silent and desolate,
> Marching to slay, thought they saw gods, not men.
> The city that by temperance, fortitude,
> And love of glory, towers above the clouds,
> Then fell, but falling kept the highest seat,
> And in her loneliness, her pomp of woe,
> Where now she dwells, withdrawn into the wild,
> Still o'er the mind maintains from age to age
> Her empire undiminished."

The martial games, with the cars and chariots that once glittered on these old causeways, have vanished, the splendid tumult has passed away, and silence, desolation and death brood over the Campagna, once the busy haunt of men, the camping ground of mighty armies.

The ruins of ancient Rome are almost innumerable, but those more generally sought for are the Coliseum, whose broken walls, 157 feet high, once encircled an area of nearly six acres, and had seats for 87,000 spectators. The palace of the Cesars, to which I have referred, the Roman Forum of Trajan, with its rostrum, from which Mark Antony came "to bury Cesar, not to praise him,"—the famous Claudian Aqueduct—the tombs and Columbaria—the theater of Marcellus, and the baths of Titus and Caracalla—which last are among the most surprising of all the ruins to be found in Rome. We are accustomed to regard an establishment for bathing as some small structure of a temporary character, but not so with these imperial baths. They were on a scale of magnificence and grandeur of which it is difficult for us to form an idea. Baths were provided for 3,000 persons, and above them were arranged royal apartments, gymnasiums, besides other conveniences and luxuries of an imperial palace. These ruins resemble vast fortresses of brick and mortar, and it would seem that nothing but an earthquake or gunpowder could have reduced them to their present condition. In excavating the debris from these baths, some of the finest specimens of ancient sculpture now in the museum of the Vatican were discovered.

Near to the Coliseum is the brick basin, or Sudarium, where the gladiators were accustomed to wash after their combats. Here is also the splendid arch of Constantine, erected to commemorate his victory over Maxentius, and a little beyond is the arch of Titus, one of the most beautiful in Rome. A well worn foot path around the arch testifies how faithfully the Jew adheres to the traditions and prejudices of his race. They remember that their own dear Jerusalem was once encompassed by armies, therefore they refuse to pass beneath the arch which commemorates the event.

The Pantheon, built by Agrippa, cannot be classed among the ruins of Rome. This noble, well preserved structure was consecrated as a Christian church in the year 608, under the name of Holy Mary and the Martyrs, and made sacred in the history of art as the burial place of Raphael. So also of the Mausoleum of Hadrian, now known as the castle of St. Angelo, and from whose battlements bristle the guns and bayonets of the Papal Zouaves.

Among the many interesting remains of the early Romans are the well preserved Columbaria, or sepulchres for the deposit and safe keeping of urns containing the ashes of the dead, after the process of cremation, or burning, a custom very general during the time of the early Cesars. Many of these sepulchres were built and managed by speculators, similar to some cemeteries in our own country. They are provided with recesses, or semi-circular niches, just large enough to receive the cinerary urns, over which were fastened tablets bearing the names of the deceased, and a fee was exacted by the owners for the deposit of the ashes. We were shown in the Etruscan Museum an iron bedstead, or gridiron on legs, upon which it was said the bodies of the dead were roasted until the flesh was burned off, preparatory to the process of calcining the bones, which was carried on in a small bronze retort. The grand old tomb of Metellus, and those of the Scipios, which "contain no ashes now," and of Sempronius, whose "voice was still for war," awaken a thrilling interest in the history of those whose families, and whose names are associated with the most glorious deeds of old Rome.

The first impressions of modern Rome are usually disappointing. It seems to possess little in common with the old city, in fact it does not occupy the same site, but is built upon the spot of the Campus Martius, where Roman youth went through with their military exercises. The Piazza del Popolo forms a sort of head for a tripod of streets, which extend from it; the center one being the famous Corso, which runs about a mile toward the Roman Forum. The street is narrow, but possesses considerable grandeur from the number of elegant palaces and tolerably decent small shops on either side, but it is inferior to Broadway in length, width, as also in the number and variety of fine buildings. Some writer, however, whose imagination seems to have run away with his common sense, declares that "the Corso is the finest street in the world."

Modern Rome is a city of churches, palaces, cardinals, priests, students, idle people, dirty streets, foul odors, beggars, and filthy monks, many of whom, it is said, have a rule to wash but once in three years—a story that I was quite prepared to believe whenever I saw one of these unwashed characters, and the streets are full of them; besides this, and in spite of the purifying character of the Christian religion, the habits of the lower classes of Rome are more disgusting than in any city I have yet visited. They don't know how to be decent, and no one seems to care whether they are so or not. Strangers have a right to expect a marked degree of refinement in Rome. It is the throne of a temporal and spiritual pontiff, whose influence reaches the hearts of millions of devotees; and if cleanliness and godliness go hand in hand, I should say that outwardly there was a great want of both in Rome.

The church edifices of Rome number upwards of 350, and it must always remain a mystery to the uninitiated how so much wealth was ever gathered for their construction and liberal adornment, and even how they are now maintained. Millions were lavished upon St. Peter's alone, and millions more must have been expended upon three or four more of the great basilicas, to say nothing of the hundreds of smaller churches, some of which are costly edifices The fine old church of St. John Lateran, with its singular baptistry, where Constantine was baptized, is under the pastoral charge of the Pope. It contains, among other rare things, two human skulls, which are exposed several times a year as those of St. Peter and St. Paul. The church of Santa Maria Maggiore contains the splendid new sepulchre recently consecrated by Pius IX. for his own burial, also some rich chapels. This gorgeous church of the Jesuits has its precious marbles, and a miracle-working image of the Virgin. The gaudy Minerva is historically celebrated as the place where Galileo was tried and sentenced for the belief that our planet had a proper motion and revolved around the sun, a truth which he afterward abjured as a heretical and absurd doctrine Still more splendid is the church of St. Paul, recently built upon the site of an old basilica destroyed by fire, and which is situated on an open plain some two miles beyond the gate of St. Paul, upon the spot where the great apostle was buried. To my mind this is the most chaste, simple, and elegant church edifice in all Europe. Externally, it has neither merit nor pretension; internally, it is marvellously beautiful.

About a mile beyond the church of St. Paul, in a lonely, fever-stricken valley, and within a little enclosure, are three churches that cannot fail to interest every visitor. One, a very ancient basilica, is dedicated to two saints, whose bones lie buried beneath the pavement. Another, called the Stairs of Heaven, stands over the cemetery of St. Zeno, in which were buried 12,000 Christians, who were compelled to work on the baths erected by Diocletian. The third, even still more interesting, is the chapel of the Three Fountains, built upon the spot, where, according to tradition, St. Paul was beheaded, and as the head fell from the body, it bounded three times, and upon each spot where it struck, springs of water miraculously gushed forth, which to this day continue to supply excellent water. The stone pillar upon which he is said to have suffered decapitation, is also kept as a sacred relic. Over the three springs they have erected altars, supported by black porphry columns, unique for their size and beauty.

Upon the Janiculum hill, which commands a magnificent view of Rome, stands the church and monastery of St. Peter in Montario, within the court of which tradition says St. Peter—though some scholars have declared that not a particle of evidence exists that this Apostle was ever in Rome—suffered martyrdom under Nero. A small chapel covers the spot, and the monk in attendance is happy to scoop up a little yellow sand to give to visitors as a relic of the event; there is no end to the supply. The church of St. Peter in Vincoli, on the Esquiline hill contains the great clumsy statute of Moses, by Michael Angelo—"frowning with the terrific eyebrows of Olympian Jove"—with goats horns upon his little head, and legs heavy enough to support an arch of the Coliseum. Here are also presented the chains that bound the Apostle Peter in the prison at Jerusalem. The chains are only shown on the festival of the saint, which happened at the time of our visit. The church was decorated, and brilliantly lighted by a hundred chandeliers; the music was exceeding fine, and it was amusing as well as interesting to witness with what eagerness the assembled crowd hugged and kissed the venerable chain as it was presented to them by a priest.

Upon the Capitoline hill, near the Palace of the Senator, and approached by a flight of one hundred and twenty-four marble steps, is the Ara Cœli, a church of the Franciscan friars, built upon the site of the temple of Jupiter Capitolinus. It is one of the most interesting sacred edifices in Rome, not only on account of its high antiquity, but from the fact, as Gibbon tells us, that "on the 15th of October, 1764," in this church, as he "sat musing amidst the ruins of the Capitol, while the barefooted friars were singing vespers, that the idea of writing the "Decline and Fall of Rome" first started to his mind."

I refer to this church, however, more particularly for the reason that it contains among its venerated treasures a most extraordinary image called the "Santissimo Bambino," a wooden figure of the infant Savior, which is alleged to possess the miraculous power of healing the sick. We were curious to see this image, and therefore climbed the fatiguing staircase, and finding one of the friar-monks, to whom we made known the object of our visit, he kindly conducted us through the church and sacristy into a small side chapel in which is fitted up a very respectable looking cupboard expressly for the safe keeping of the little image. After lighting a couple of candles—a custom always observed—the friar proceeded to unlock the door, took out a box, and after devoutly kissing it, commenced to uncover a figure about two feet long, having an elegant silver crown upon its head, gold shoes upon its feet, and the body swathed in garments of the richest description, studded with precious stones. With a view of gratifying a laudable curiosity, we made inquiry of the friar—who was a prodigious snuff-taker and was the owner of very capacious nostrils—concerning the history and miraculous power of the "Divine Bambino." He informed us that it was carved by a Franciscan monk from a tree which grew upon the Mount of Olives, and that upon the completion of his exquisite work he was sadly puzzled to know how and in what way he could apply the necessary coloring. In his deep distress he called for aid, and in answer to his fervent prayer a divine artist mysteriously completed the work while the friar was asleep. When on its voyage to Rome, the Bambino fell into the hands of Satan; but somehow it got to its destination, by the way of Leghorn, and for centuries has been an object of pious devotion on the part of the sick, so that at one time its income exceeded that of any other doctor in Rome. During the exile of Pius IX., the Bambino made its family calls in the papal carriage, but on the return of his Holiness the image resorted again to its own old brown vehicle, and still continues to visit its patients, with the professional ceremony of a medical attendant. The friar further informed us that at the special request of a sick lady of wealth and distinction, the Bambino was permitted to remain at her house for several days, during which time she had a duplicate made and sent to the Ara Cœli. The trick, however, was discovered in a most miraculous manner. At an unusual hour the chimes of the church bells rung a supernatural peal, which caused the people to flock towards it, when the real, genuine Bambino was found standing upon the high altar, having made its escape from the sick lady's custody and returned to the church.

The friar told us these and many other stories with all the gravity possible, although to us, not being accustomed to such things, there was too strong a smell of improbability about the truth of the statements for us to accept them, even in spite of the certificate of Dr. Van Swygenhoven, an eminent physician who had the honor to belong to thirty-seven

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different learned societies, and who testifies that after himself and wife had exercised a vivid faith, the Bambino cured her at once of a chronic heart disease.

I am drawing no fancy sketch to amuse the reader. Every visitor to Rome has either heard of or has seen the "Santissimo Bambino," which has long been one of the harmless lions of the city. It is not only made the subject of solemn religious ceremonials, but its fame has already become the subject of an eloquent sermon by Antonio of Cypress, who graphically recounts the history of the Bambino—its many vicissitudes and miracles—to which is appended the usual certificates of cure.

The Church of St. Clement is another very interesting edifice. Some writers think it may have been a pagan temple, but the discovery of another church underneath, which possesses unmistakable evidences of the Christian faith makes the upper St. Clement comparatively modern. Excavations still going on underneath show an almost perfect church structure, a primitive basilica abandoned and unknown for nearly a thousand years. Still below this another buried edifice has recently been unearthed, consisting of a small chapel and suite of adjoining rooms, which are believed to have belonged to St. Clement's house. What a strange combination have we here! A Christian church and chapel, buried for centuries underground, and standing above them both, another church, so very ancient that for centuries it was supposed to have been erected to an unknown god.

Beneath the Church of St. Joseph, near the forum are the famous Mamertime prisons or dungeons, where Jugertha was starved to death and where the Cataline conspirators were strangled. It is stated that St. Peter and St. Paul were both imprisoned here, and a place is shown in the travertine wall —now covered by an iron grating—as the spot where St. Peter's head was struck, forming a considerable depression—a hard head, and a tough story to believe.

Monasteries are numerous in Rome, although the number of their inmates is gradually decreasing. One of the strange sights of Rome is to visit the chambers under the church of the Capuchins, to witness the extraordinary system of burial practiced by the monks. Here are a series of vaulted apartments provided with holy mold brought from Jerusalem, which is supposed to possess peculiar dessicating properties. When a monk dies the body is buried in the earth, or oldest grave, from which the last occupant was removed. The bare bones and skull are exhumed, and arranged fantastically about the walls and ceilings in the shape of scales, chandeliers, rosettes, crosses, and other emblems of business and religion, the whole forming a very cheerful and pleasing spectacle of our frail mortality. The bones of the more favored dead brethren are wired together and rehabilitated in the brown sack and cowl of the order, such as were worn by them during life, and thus attired they are arranged in sitting posture, in recesses, where they sit and grin and stare upon visitors through eyeless sockets, thus presenting "amiable and lovely death" in that attractive form so pathetically coveted by Queen Constance. So much for the novelties of the Roman churches.

Lottery offices are about as numerous in Rome as the churches. They are regularly licensed by the authorities; some are even uncharitable enough to say that the government has an interest in the spoils. It almost always happens that the poorer the people are, the more they seem willing to squander their money on these lottery swindles, and the Romans are no exception to this rule. They waste a great deal in this way, and entertain many singular superstitions about the mode of choosing lucky numbers. Dream books are largely consulted, and the most trivial circumstance is often construed into an omen of success on certain numbers. Sometimes children are sent into the streets to inquire of a stranger the time of day, and the figures given are used in selecting numbers in the lottery. These people are more to be pitied than blamed.

We happened to be in Rome at the opening of the carnival. It was a strange sight to see the grotesque costumes, the indiscriminate throwing of *confettos* and bouquets, the gorgeous procession of the Senators and other high dignitaries of the city, and the running of horses through the Corso without riders. It is a strange people, and a strange government that delights in and encourages such things.

S. H. W.

Improved Concrete Pavement.

Patented by Wells H. White, of Troy, Ohio. Take of hard or distilled tar, five parts, of common coal tar, one part, and boil them for several hours. Then take of good sand or fine gravel, three parts, and of stone-coal ashes, from one to two parts, according to the degree of hardness it is intended to give the composition when first laid down, and mix them thoroughly together, and put them into a flat-bottomed heater made of heavy sheet iron, and heat the whole mass to a high temperature, stirring them while heating. Then pour into the mixture several bucketsful of saturated solution of salt, according to the quantity of gravel and ashes. Then pour into the foregoing mixture the boiling composition of hard and soft tar, and mix thoroughly. Then take out in suitable vessels, and pour the mixture over the ground to be paved, duly prepared to receive it, and spread it evenly, and, while yet hot, roll it with a heavy hot iron roller until the composition is perfectly packed and smooth, using marble dust as a parting sand, until the pavement is finished as desired. In about ten hours it will be hardened into a firm, smooth pavement.

GAY LUSSAC has observed bars of iron which became almost as brittle as glass by remaining for a long time at a high temperature in an oven.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Clock Repairing.

We condense a letter received from a correspondent which seems to give some valuable suggestions on the above subject. The writer says: "I live in the country and have followed clock and watch repairing nearly twenty years. There seems to be a general complaint among people, all over the country, about their clocks not being properly repaired. People carry their clocks long distances to be repaired, pay a good price for the work, take them home, and find they wont go. By examining these clocks I find that the pivot holes had been too large and that the punch and hammer had been used to 'upset' them for the purpose of making them smaller.

"My way is to take good brass wire, a little larger than the pinion, drill a hole lengthways in the wire, a little deeper than the thickness of the plate, cut it off, put it on an arbor, and turn it slightly tapering. Then make the old pivot hole perfectly round and large enough to receive the box, which drive in from the inside of the plate, file it down level, and ream the new pivot hole to fit the pivot. No solder is used for fitting the boxes, and I never knew one to come loose. Some may think it is too much trouble to make boxes and put them in; but to those I will say, I make mine when I have an hour or so to spare, and the fitting is but little more work than using the punch and hammer." G. F. A.

Sing Sing, N. Y.

Curious Optical Effect.

MESSRS. EDITORS:—Two straight lines or forms, placed in relation to each other as indicated in the diagram,

seem greatly disproportionate in length, although they are exactly equal. I have tried the illusory experiment a hundred times on as many different persons, and they have invariably pronounced the perpendicular line much the longest. Will some one or more of the "*Scientific Americans*" please give us an explanation of this deception? J. HERVA Jr.

Rockford, Ill.

Colorless Drying Oil for Paint.

MESSRS. EDITORS:—The article on page 153, current volume, entitled "Chemistry of Paint," gives Mulder the credit for inventing a new process for obtaining a colorless drying oil. I am in possession of a book published in Magdeburg in 1821, and brought to this country in 1837—at least that was when I saw it—in which the same process, with the same results, is described. It seems, however, to be superior to Mulder's. I subjoin a translation: Take 5 gallons of water, heat it to the boiling point in a vessel holding 15 gallons; when about to boil add 5 gallons of linseed oil and 1 pound of red lead. Keep it constantly boiling and stirred up for two hours over a slow fire. If not constantly stirred the lead will sink to the bottom and cause the oil to spatter. It is then taken from the fire and left to settle, when it will be found that the oil is clear and colorless. J. HECKEL.

Decatur, Ill.

How to Catch Rats.

MESSRS. EDITORS:—For catching rats in a cheap and effectual manner allow me to recommend the following: Cover a common barrel with stiff, stout paper, tying the edge around the barrel; place a board so that the rats may have easy access to the top; sprinkle cheese parings or other "feed" for the rats on the paper for several days, until they begin to believe they have a right to their daily rations from this source. Then place in the bottom of the barrel a piece of rock about six or seven inches high, filling with water until only enough of it projects above the water for one rat to lodge upon. Now replace the paper, first cutting a cross in the middle, and the first rat that comes on the barrel top goes through into the water and climbs on the rock. The paper comes back to place and the second rat follows the first. Then begins a fight for the possession of the dry place on the stone, the noise of which attracts the rest, who share the same fate.

Decatur, Ill. J. H.

The Value of Dried Potatoes.

MESSRS. EDITORS:—Allow me to invite your attention to a recent discovery that must prove invaluable to the South, now that cotton can no longer be profitably raised.

Cotton had been known for generations, but only to supply the family's need, until the genius of Whitney responded to a world's demand So, also, the sweet potato can be grown in fabulous quantity; but its perishable nature confines it to home consumption. The present discovery, however, will render this also a staple article of commerce.

A bushel, when pared with the knife, which wastes much, weighs fifty-two pounds; but, when dried, only ten pounds, having lost in bulk three fourths, and in weight four fifths! Half a pound, when boiled three quarters of an hour in an earthen vessel (tin discolors), fills a large dish, in color and flavor precisely like the root on your table at this season of the year. Twenty cents a dish would not be considered high, and yet it gives three dollars and seventy cents a bushel to the planter; for ten cents will pay the cost of drying, and twenty cents that of boxing and freight to market. Now strike off one half for margin and merchant's profit. and did cotton ever pay anything like this—when you consider that five hundred bushels to the acre is not uncommon?

You are aware that the sweet potato undergoes a chemical change, a few weeks after being dug. At first it is dry and mealy, and is a universal favorite, but then it becomes soft and soggy, and is by many rejected. It is evident that no such change can take place in the specimen herewith inclosed, hard as flint stone. This delicious vegetable can therefore now be placed on the table every day of the year, in its best condition.

There will be a great foreign demand, for in Europe it is scarcely known; and even in our own country, west and north, it is seldom seen.

You will find, also, specimens of Irish potato. The first trial with this was a complete failure; they came forth almost black, and I gave it up in despair But further reflection suggested that, when cooked, they are white. What is the difference? Heat. Accordingly they were submitted for a few minutes to steam, in order that the outer surface might be cooked, and form a mucillage impervious to the atmosphere. The result was a complete triumph; they came forth bright, and almost semi-transparent. If you slice some potatoes, and boil them, they cannot be distinguished from the dried when similarly treated.

It is evident they will keep during the longest voyage. How valuable for sea stores, with only one fourth their original bulk, and one fifth their weight. How important in a sanitary point of view, for there is no scurvy with potatoes twice a week! FRANCIS H. SMITH.

Baltimore, Md.

[The specimens of sweet potatoes inclosed are hard and almost transparent, resembling raw hide as prepared for loom pickers. The Irish potatoes are of a chalky whiteness, and equally hard. The invention appears to be valuable. During the war dessicated vegetables were largely used in the army, with the happiest results.—EDS.

Self-adjusting Telegraph Magnet.

MESSRS. EDITORS:—I noticed, on page 178, current volume, a communication, signed "S," in which he states that a self-adjusting telegraph magnet is an impossibility. I hardly think the writer is safe in making such an assertion, as a self-adjusting relay has already been invented by Messrs. Duxbury & Roberts—two very intelligent practical electricians of Boston—which has been thoroughly tested by experienced electricians on the Western Union Company's lines between Boston and Portland.

This relay readily adjusts itself, by means of a reverse current, to the changes of current on the wire caused by "escapes," "crosses," "grounds," etc.

Although the elasticity of a small wire spring commonly used on relays, admits of a finer adjustment than a common magnet, this relay seems to do its work as well as any spring adjusted by hand. Although this is a great invention, I do not call it so wonderful as that invention for sending and receiving dispatches over the same wire, at the same time; and I think it would be hardly safe for "S" to call *that* an impossibility, as it is now being done over the Franklin Company's lines between New York and Boston.

Portland, Me. D. C. S.

Science Familiarly Illustrated.

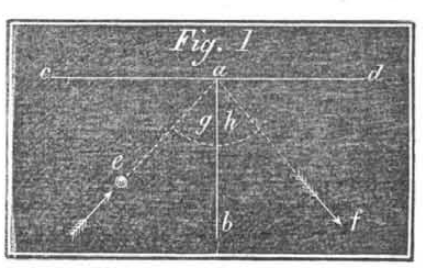
HEAT AND COLD.

BY JOHN TYNDALL, ESQ., LL. D, F.R.S.

Lecture VI.

In our last lecture I endeavored to explain to you the law according to which radiant heat is reflected. I then made use of some terms which were, perhaps, rather difficult to remember. I explained to you that the angle of incidence was equal to the angle of reflection, so that if you suppose the surface of this table, *c d*, to be a reflecting surface, and this rod, *a b*, a perpendicular to the surface, when a ray of light, *e a*, falls upon the surface, striking the bottom of that perpendicular, the ray is reflected so as to lie as far to the left of the perpendicular as the direct ray lies upon the opposite side of it. That is to say, the angle of incidence, *g*, on the one side is equal to the angle of reflection, *h*, which is on the other.

And now I have to draw your attention for a moment, not to the reflection of light or radiant heat from planes or flat surfaces, but to the reflection of radiant heat from curved surfaces. I have such a surface here. It is a large concave mir-



ror, as it is called. It forms part of a large sphere of glass; it is, as it were, a slice cut from a large sphere of glass. Now, suppose a sunbeam to come in this direction, and fall plumb upon the mirror: you see that the edges of the mirror are beveled or slanted off, and the consequence is that that sunbeam striking on it would be reflected in such a way that the reflected rays would converge and form a cone of convergent rays. I want to show you that when light is thus reflected from a concave mirror it is gathered up to a point which is called a focus. We will now throw a beam of light upon it. You cannot see light itself, but you can see bodies illuminated by the light; and in this room, and especially in London air, and indeed in all air, there is a considerable quantity of common dirt floating in the air, and these dirt particles will be illuminated by the beam of light; and I think this will enable you to see that after reflection the beam of light will be gathered up and brought to a focus. You see the beam is now reflected from the concave mirror and is gathered up in this wonderful way into that convergent cone. If we had time, we might

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prove that this must be the manner in which the rays would behave after reflection in accordance with the law that the angle of incidence is equal to the angle of reflection.

Now, having shown you this convergence of the rays of light, I want to show you the reflection of the rays of heat; and for that purpose I have not a single mirror, but two mirrors. They are called "conjugate mirrors," and one is suspended over the other. I have here the means of obtaining the beautiful electric light from a battery of fifty cells: if I now place this light in the focus of this mirror the rays will be reflected upwards, and if the mirror were perfectly true they would be reflected upwards in a parallel beam, or, so to say, a solid cylinder of light. Now remember what occurs. The rays of light will fall upon this lower mirror; they will be reflected upwards by it in a straight cylinder; that cylinder of light will stike upon the upper mirror, and will be converged, and reflected again from the upper mirror, and brought to a point in what is called the focus of the upper mirror. You will see these rays of light going upward through the dust of the room when the room is darkened. I intended to have a silver bead in the upper mirror; and if it were there you would see it shining with the brilliancy of the sun, owing to the convergence of these rays of light in the upper mirror. If I put the light in the upper mirror instead of the lower one the rays would be brought to a focus in the lower mirror. I want to show you this with heat; and for that purpose I will take some boiling water. I lower the upper mirror and hang in its focus a flask of hot water; and now we will examine what occurs with the rays of heat. Having placed the flask in position, I draw the mirror up into its former place near the top of the house; and now the rays of heat are coming down from that hot water. Although you cannot see them, they are coming down as the rays of light which were given off from the electric light just now. The rays of heat are striking upon the surface of this mirror, and they are collected and brought to a focus here. I think that by means of our beautiful thermo-electric pile I shall be able to show that this is really the case. I now bring the face of the pile under the mirror, turning it downwards—not upwards, towards the hot water. You observe that the needle very soon moves, in virtue of the heat which is reflected by the lower mirror and collected to a focus in this way. I will now turn the face of the pile towards the cool region of the room, and allow its heat to waste itself; and now for the flask of hot water I will substitute a totally different body—a very cold one. I will, in fact, place a freezing mixture in the focus of the upper mirror, and then operate with the pile exactly as I did when the flask of hot water was there. You will now observe that the needle will move in the opposite direction. It will first come down to zero, and then move up on the opposite side. There will be a very sensible deflection, indeed, if I hit the right point. [The deflection took place as indicated.] Now, I dare say many boys here present think that, as rays of heat issued from the vessel containing the hot water, so rays of cold issue from the vessel containing the freezing mixture. That, however, is not the case. In the case of the freezing mixture our thermo-electric pile is the warm body. It is hot compared with the freezing mixture, and that pile radiates its heat against this lower mirror; the heat is reflected above, is re-reflected against that mirror, and is then absorbed and drunk up utterly by the freezing mixture, so that the pile in this way wastes or loses its heat, and therefore gives that deflection of the needle due to cold. Instead of this freezing mixture or the bottle of hot water, I will now place in the focus of the mirror a body which I hope will be given to me in a bright cherry-red hot state. A copper ball has been placed in the fire in the next room; we will suspend that copper ball when it is red hot in the place which was occupied by the freezing mixture, and see whether we cannot get very visible evidence of its radiation. I do not like to use the thermo-electric pile in this experiment; but I have here some black paper, and sometimes we are able to make paper smoke in the lower focus. I place this paper below in the focus, but I see the ball is not hot enough to burn it; there is no apparent action; but I can feel the heat very strongly indeed, through the reflection of the rays, so that my hand can not rest there. Some of this paper smoked freely yesterday when brought within the focus. If I place the face of the thermo-electric pile there for a single moment, you will find what I said to be true. The action of the needle proves that you have there the focal heat I have been endeavoring to describe.

Now we have to pass on to the still further consideration of these rays of heat; and I will first of all try to make plain to you wherein consists this wonderful light that we have been operating with so often. I will take a thin slice of this light and try to unravel it before you. The screen will be lowered in order to enable me to do this, and we will lower the roof so as to darken the room. You will see the beam of electric light making itself evident in the dust of the room; and this lens enables me to obtain a beautiful image on the screen. Now I want to twist that beam aside. That white mass of light which you see, is due to a mixture of lights of various colors. I will twist this beam aside by means of a prism, and separate these colors one from the other. First of all I will send the light through a single prism, thus, which gives this wonderful, rich display of colors upon the screen. Nothing can be more beautiful than this—so rich and lovely. And now I will try and make the band still bigger, not richer; it is imposible to have it richer or more beautiful than that. For the purpose of increasing the size of this band of colors I will send the beam through another of these prisms, which will pull it aside still further, and spread these colors still more. You now have the beam passing through a second prism, and when I bring the beam into the field you have this splendid band thrown on the screen. This is called a spectrum. This was the great discovery of Sir Isaac Newton. He found that white light was composed of all these colors; and if it were consistent with our present course of lectures, we could make these colors combine again and form white light. We will now turn up the gas, and you see how dead the spectrum becomes when the light falls upon it. I asked for the gas light in order to choose a boy "ruddy, and of a fair countenance." [The lecturer then selected a boy answering to this discription, and led him to the screen. The room was then again darkened.] You will find what happens to the color of his face when I lift him into the midst of this spectrum. Here [holding the boy's face in the red light] he is blooming like a rose. Now [transferring him to the yellow] he is like something very different from a rose.

Now I want to say a few words upon this wonderful spectrum. You see a great mass of light here, and you might suppose that that is all which comes out of that wonderful electric lamp; but that is, in reality, not at all the case. You have here a certain distance which is rendered visible to the eye by these splendid colors, but there are rays extending about as far on the outside of the extreme red, as the green color is on the other side of it. The most powerful radiation emitted by the electric light does not fall on any part of the visible spectrum, but it falls as far on one side of the red as the green is from the other. And so also at the other end of the spectrum we have a vast body of rays stretching out beyond the visible portion; but all these ultra-violet rays and the ultra-red rays are perfectly incompetent to produce vision, although a great number of them reach the retina. I now want to make evident to you the prolongation of the spectrum in the direction of the violet, and for that purpose I must make use of a less expensive spectrum. We have produced this by means of prisms of liquid, but I must now make use of a prism of glass, or else have only one of the liquid prisms instead of two. I want to give you an idea of the comparative power of the luminous rays and those dark rays I have spoken of. I have now produced this present spectrum by means of one of the liquid prisms. We might, as Sir William Herschel did when he first discovered the dark rays of the sun, place a thermometer in this dark part beyond the red, and we should find that it would show an augmented temperature because of the heat falling on it from the electric light. Then if we traveled from this red end of the spectrum towards the other, we should find that the thermometer would gradually sink, and if we went back again it would rise gradually through the violet, through the blue, through the green, and the yellow, and the orange to the red, the red being the hottest part of the visible spectrum. But Sir William Herschel did not stop here, but made a further discovery. Far beyond the red he found very powerful rays falling upon the thermometer, and he represented the rise of the temperature by lines of certain length. He represented the least heated part by a short line, and the next by a longer one; the line representing the heat of the green is of a certain length; and the heat of the yellow was marked by a longer line still. The whole visible radiation from the sun was determined in this way by Sir William Herschel; but we have now far finer methods, and with the electric lamp which you now see before you, we went over these colors with a thermo-electric pile. The whole radiation of the visible portion of the spectrum is represented by this small colored area that you see represented on the diagram; but over and above that and beyond the red end of the spectrum, you have an amount of heat which is represented by this great mountainous peak. The invisible radiation is nearly eight times the visible; that is to say, only one-eighth part of the rays emitted by the electric light is competent to excite vision, all the rest are rays of heat, and not rays of light.

And now I want to show you the prolongation of the spectrum in the other direction; and for this purpose I will make use of a prism of flint glass instead of this prism of bisulphide of carbon. I place the prism exactly as in the former case; the display of colors is not now quite so brilliant, but the glass is more transparent to the rays that I want to show you than the bisulphide of carbon is. I have here a certain substance called sulphate of quinine; and I have here also a screen of white paper which was wetted with this substance before the lecture. It was found by Professor Stokes that this substance has the extraordinary power of rendering visible these invisible rays of light beyond the violet. Now, observe this band of light which becomes visible beyond the violet, when I introduce the paper screen which has been spread with the sulphate of quinine. There is darkness when the screen is not there, but when it is held up you see this lovely band of color produced. If I take the liquid itself and daub it upon a piece of paper, it will render the invisible rays visible. I have here also the means of changing the color of rays by means of this beautiful violet glass, and rendering rays visible which were hardly visible before. Here is a piece of paper, on which are printed the words "A happy new year." As you look at it you see nothing upon it, by the ordinary light, but if we put up the violet glass observe how beautifully the letters come out.

So much, then, for the existence of rays beyond the red end of the spectrum, and also beyond the violet end, which are incompetent to excite vision. These are what are called invisible rays. Before I proceed further I should like to show you an experiment by means of these powders. Professor Stokes has called that action which makes the sulphate of quinine visible "fluorescence." The phenomenon called fluorescence has been known to philosophers a long time. It was observed that certain substances had the power, so to speak, of drinking in light, and then giving it out gradually. M. Edmond Becquerel, of Paris, has rendered himself exceedingly famous by his investigations on this subject, and the powders I have here were selected by him. I am indebted to Sir Charles Wheatstone for them. I will show you that if these powders are shown upon by the electric light, and then the lamp is extinguished, the powders will still retain their luminosity; they will still have the power of giving out light. They, as it were, drink in the light and then give it out slowly and by degrees. [The powders were exposed to the electric light for a short time, and the light was then extinguished.] There, you see the powders are self-luminous, and emit this beautiful light. I have here a beautiful butterfly formed of these powders. It is painted upon glass. You see the surface of the glass is now perfectly dark. It emits no light; but if I allow the light of the sun or the light of the electric lamp to shine upon it for a short time, you will see that it has the power of drinking in that light, and emitting it gradually. [The surface of glass on which the butterfly was painted with the fluorescent powders was exposed to the electric light. The light was then withdrawn and the butterfly was seen to have become luminous.] This beautiful butterfly is produced by means of these fluorescent powders selected by M. Edmond Becquerel.

COLE'S METHOD OF RAISING WATER.

The specifications accompanying the application for letter patent of this device declare that the object is to "construct a machine which, by the application of but little power will raise a column of water to any desired hight, to furnish motive power for machinery and other purposes."

Fig. 1.

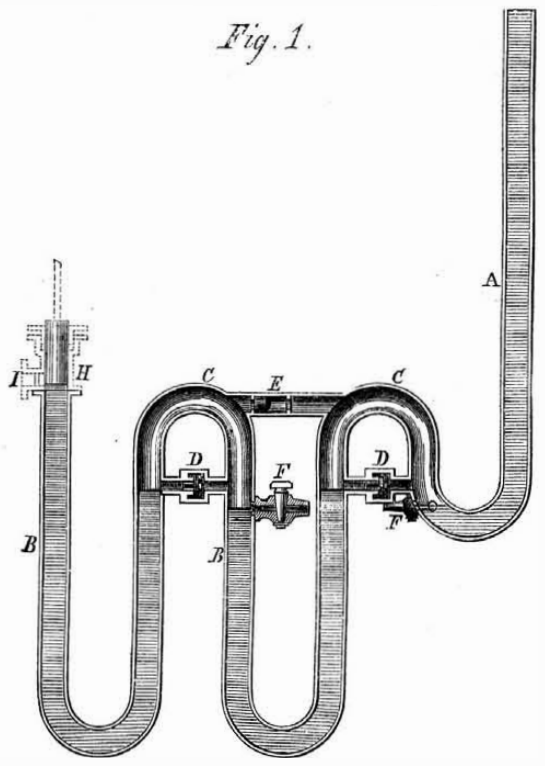
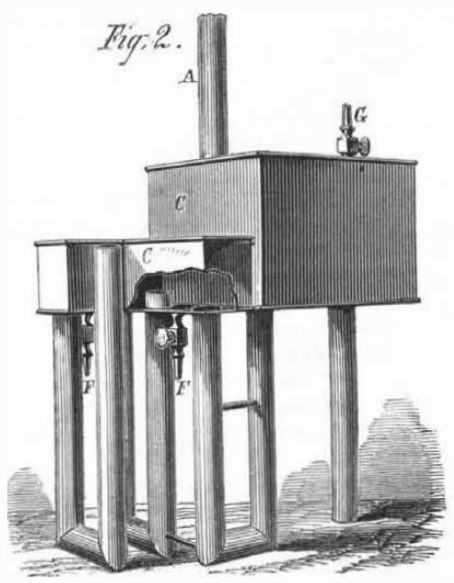


Fig. 1 represents a tube bent into the form of a compound syphon, having a vertical extension, A, above the water line equal to the columns B. The upper portions, C, are air chambers; D, are water communications between the legs of the syphons, having valves similar to ordinary check valves. E is a communication between the air chambers, having a piston working either way. F are water cocks for keeping the level of the water down to the required position.

Fig. 2 is a modification of the device, the air chambers, C, being boxes of a rectangular form affixed to the tops of the tubes, and dispensing with the communications C and D, in Fig. 1. As in Fig. 1, F represents the cocks for drawing the level of the water down below the level of the pipes which project up into the chambers. G is a cock for admitting air to the large chamber.

Fig. 2.



In operation a pump, H, Fig. 1, forces the water admitted to the syphon, at I, Fig. 1, into the pipes composing that syphon. The action of the pump, as in the Bramah or hydrostatic press, depends on the compression of air on a column of water. The inventor believes that with the elastic quality of air, he can, by the exertion of a small amount of mechanical force, and the reduplication of air chambers, force water to any requisite hight, without the expenditure of the same amount of power now used in ordinary contrivances for the same purpose. The action of the pump produces a pulsation on the columns of water, which, the inventor believes, is re-

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produced through the sucessive syphons with constantly diminishing expenditure of power, yet with equal force, indefinitely.

Patented through Scientific American Patent Agency, Dec. 10, 1867. Other improvements are being applied for through the same means. Address J. R Cole, Kenton Station, Obion county, Tenn. for any further information.

IMPROVED DEVICE FOR OILING LOOSE PULLEYS AND GEARS.

On page 178, current volume, we published a description and illustration of a simple device for saving oil in loose pulleys. The improvement represented in the engravings is an advance in the same direction. It is designed for saving oil, which is so outrageously wasted in lubricating loose pulleys and gears running on fixed studs. The inventor states that a loose pulley, on his plan, ran three weeks, ten hours per day, with the same quantity of oil usually applied in lubricating a loose pulley once, the test being made on a shaft of one and a half inches diameter running 150 revolutions per minute.

Fig. 1.

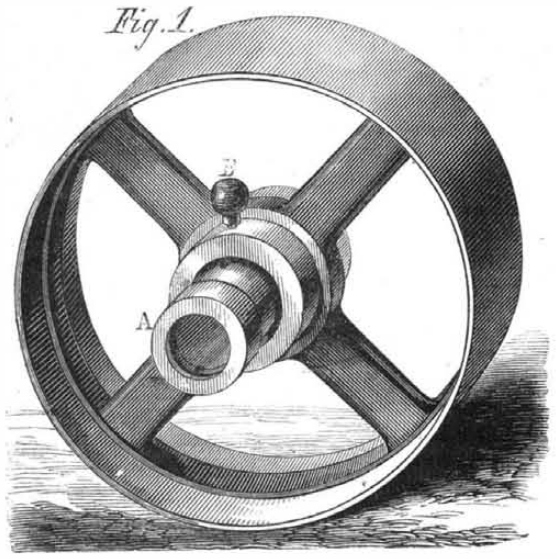
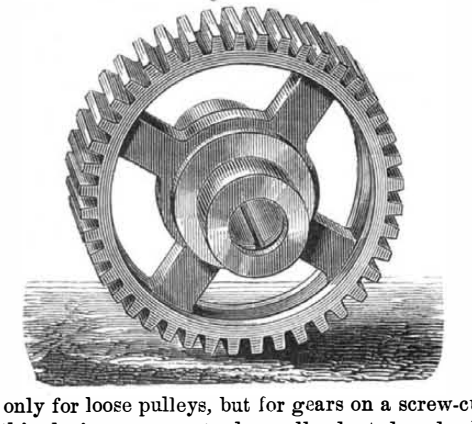


Fig. 1 is a pulley with a bushing, A, the central portion of which is turned to a smaller diameter than the end bosses, and has a number of holes drilled leading from the recessed circumferential space to an annular recess near each end. The oil is poured in through the hole closed by the stopple, B, filling the space between the outside of the bushing and the inside of the hub, from which it passes to the annular groove at either end, and thence to the shaft.

Fig. 2 is a gear without separate bushing, but having similar grooves at each end of the hub, connected by a channel, as seen.

Fig. 2



Not only for loose pulleys, but for gears on a screw-cutting lathe, this device appears to be well adapted, and, also, to all circumstances of a similar character. It is applicable to old pulleys and gears, at a slight expense, and is claimed by the inventor to save about 90 per cent of the oil commonly used, beside the time employed in frequent oilings.

Patented through the Scientific American Patent Agency, Feb. 4, 1868. Shop, town, county, and state rights can be obtained by addressing George M. Morris, or John McCreary, Cohoes, N. Y.

Glycerin and Yolk of Eggs.

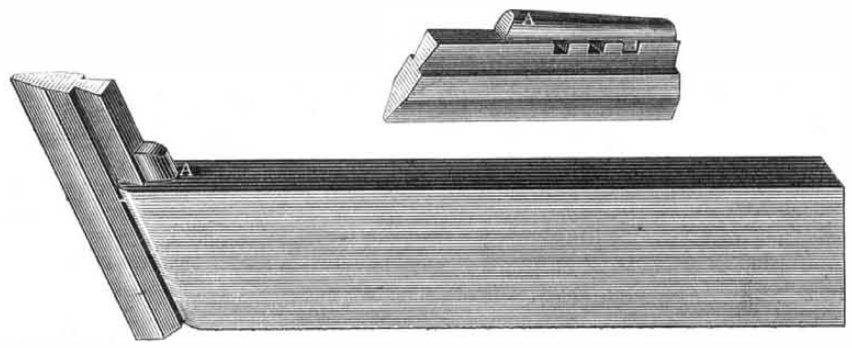
Four parts by weight, of yolk of egg rubbed in a mortar with five parts of glycerin, according to the Philadelphia *Journal of Pharmacy*, gives a preparation of great value as an unguent for application to broken surfaces of the skin of all kinds. The compound has a horny-like consistency, in unctous like fatty substances, but over which it has the advantage of being quickly removed by water. It is unalterable, a specimen having laid exposed to the air for three years unchanged. Applied to the skin it forms a varnish which effectually excludes the air, and prevents its irritating effects. These properties render it serviceable for erysipelas and cutaneous affections, of which it allays the action.

An "Elephant" Indeed.

The owners of the *Great Eastern*, mourning not simply a non-appearance of dividends, but a very heavy expense in keeping the big ship in existence, are in a sad state of perplexity, not knowing what is to become of their unproductive property. At the late annual meeting of the shareholders, the directors' report deplored the failure of the company to complete its contract with the new French cable company, the latter refusing to act up to the terms of the agreement, and the whole affair is now before the law courts for adjudication. As far as the future was concerned, the chairman tried to persuade the company that the prospects were encouraging as there were other cables to be laid and he was certain that their ship was the only one which could accomplish such an undertaking successfully. One hopeful proprietor suggested that the Leviathan should be converted into an immense floating hotel, but the plan was promptly voted down. The shareholders are certainly deserving of public sympathy.

Improvement in Turning and Planing Tools.

Of late years a new branch of trade has sprung up in providing tools for machinists. While members of every other trade and handicraft can go to dealers and buy tools to prosecute their business with, machinists have been compelled to leave their regular business and manufacture their own. There is no good reason why tools should not be made for them and used by them, at a great saving of time, labor, and expense, as well as for carpenters or masons. The SCIENTIFIC AMERICAN has frequently called attention to this subject, and a new and profitable field is open to inventors in this direction.



SHAW'S "PARAGON" TURNING TOOL.

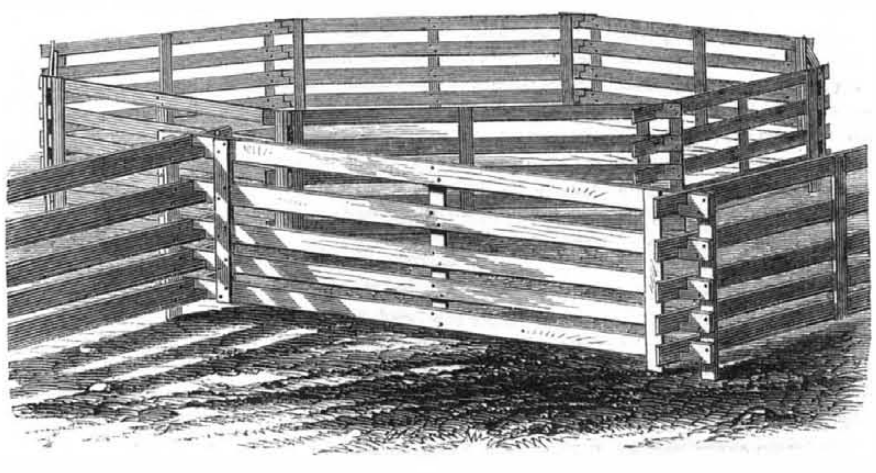
We illustrate herewith a turning tool, one of a class that has lately been introduced with considerable success.

All machinists know that in the ordinary lathe tool three fourths of the stock is wasted, or cannot be used because it is simply a holder, so to speak, for the cutting end. It is proposed to make a stock that shall last forever, and merely renew the cutting point as it is worn away. This involves a comparatively small expense, permits much better steel to be used in the cutter, saves the time and labor generally wasted in the blacksmith's shop, and, what is better still, reduces the routine of the shop to a more systematic course. The peculiarity of this tool consists in dispensing with all screws and clamps, and so constructing it that it tightens and adjusts itself to the work to be done. Externally it is precisely the same as an ordinary tool. There is nothing in the way of the work, and the cutter is raised, lowered, and held fast by the gib wedge, A. This detail has a projection on the face which engages with the slots in the cutter; when both are inserted in the stock, which is of solid steel, the pressure of the cut forces the tool down into its seat and holds it firmly without shake or jar. It is as solid as a solid tool. No hammer or wrench is required, and the cutter is never removed except to raise or renew it when worn out. They are made larger for heavy work. In appearance the tool is workmanlike, and we are assured by the manufacturers that they have given satisfaction where used.

This tool is the invention of Thomas Shaw, of Philadelphia, Pa. For further information address Philip S. Justice, 42 Cliff St., N. Y., or 14 North 5th, Philadelphia. [See advertisement on another page.]

Improvement in Portable Fences.

The advantages of fences which may be set up and taken down, removed from place to place, and adapted to inequalities, are so obvious that such temporary inclosures and guards are in quite extensive use. That seen in the engraving is simple, cheap and handy. It consists of horizontal slats or bars united by upright cross pieces, the horizontal bars having, near their ends, notches cut for the reception of the ends of alternate sections, the notches of one end of the sections being cut on the upper and those of the other on the lower edge of the slats. For a continuous fence the angles formed by the sections are no more than required for the necessary stability, while for pens of square or nearly circular form the fence forms a ready means of confining animals or stock, or of protecting young trees, etc. The engraving shows the sections arranged as a fence at varying angles, and also an octagonal pen for temporary purposes.



WILL'S PATENT WORM FENCE AND PEN.

The sections may be built by an ordinary mechanic or farmer, under shelter, during the winter, when outdoor work is inconvenient. They may be made of the cheapest stock, need no posts, and require no labor of digging, are sufficiently firm to withstand storm and wind, and are easily put up, being light and portable.

Patented through the Scientific American Patent Agency, January 14, 1868, by John Will, Bryan, Williams county Ohio, whom address for additional particulars.

Glycerin.

The consumption of glycerin, owing to its many useful qualities, has of late years increased in such a manner that it is becoming no inconsiderable article of commerce and manufacture. Several large factories have been started in this country, and their product is fast driving out the imported article. Mr. Laist, of the firm of Hartmann, Laist & Co., in Cincinnati, Ohio, who have been engaged in this business for over five years, has patented through this office a process by which he obtains the glycerin perfectly pure, anhydrous, and white, equal in every respect to that of Price's, of London, whose make has been standard for the last ten years. The price of their glycerin is only about half of that manufactured by Price.

Their glycerin has been examined by eminent chemists and has been found to be perfectly pure and inodorous. The firm are now enlarging their factory so as to meet the demand and we are pleased to see them increasing the product of our manufactures by putting to use what had formerly been wasted.

COMPOUND BATHS FOR HARDENING STEEL.

From Milwaukee, Wis. we have received a letter in regard to tempering steel which takes exception to the views of our correspondent "P. Mc C., of N. J." and to our remarks, published on page 137 current volume, in relation to baths for hardening steel. He says: "your correspondent may be a practical man; I have seen many like him who object to compound baths. I have forged steel in New York for nineteen years, and my reputation as a tool maker for the marble trade was not bad. I used to temper in pure water and did not believe in compound baths of any kind. I took up forging mill picks and found that nineteen years' experience was of little value for tempering mill picks in pure water; to do good service in cracking French burr mill stones something better was needed. I found the basis of all baths should be carbonic acid. Those chemical compounds that infuse the most of it in a bath are the best, because iron and steel have the most attraction for it. My bath was patented through the Scientific American Patent Agency about a year ago, and I am now using it with success. I do not believe that baths of any kind will make bad steel good, but I have worked steel into good picks that had been rejected by a practical forger as unfit for mill picks; I forged it in the usual manner, but used my bath." W. G. E.

Cleaning Cloths Used by Bank-Note Engravers.

H. M. Baker, of New York city, has obtained the following patent: The nature of this invention consists in dissolving the gummy portion of the ink with coal tar, benzole, or coal tar naphtha, or with the refined coal-tar light oils, and pressing out the coloring matter with mechanical appliances while the cloths are immersed in either of the compounds above specified. The cloths are then removed and submitted to the action of steam in an appropriate vessel, which vessel may also contain water, with or without the addition of soap or alkalies. They then may be rinsed, pressed, and dried, and are ready for use again. The solution of gummy matter and the undissolved coloring matter may be placed together in a distillatory apparatus, and the benzole, naphtha, or light oils distilled off, which gives back the solvent and leaves the printers' ink in the retort. The ink may be removed and ground, and is ready for market or use again. The advantage of this invention is that it enables the engraver to cleanse his cloths without injury to the fiber, and at the same time to recover a large percentage of the expensive ink employed by him, which has heretofore been entirely wasted in the processes used for cleansing his cloths.

NEAR the site of ancient Nineveh a summer temperature of 140° F. has been experienced, and is the highest temperature authentically recorded.

THE atmosphere absorbs nearly 40 per cent of the heat of the sun's rays.

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Electric Marine Buoys.

A scientific man, M. Emile Duchemin, has been for several years engaged in experimenting on the ocean as an electric agent, and has recently arrived at results which may turn out to be important and which are certainly interesting. The object in view is the construction of a marine pile, which shall give a constant current of electricity as long as the elements last. He tried at first with copper and zinc, but the result was not satisfactory, the gas produced sometimes left a non conducting substance on the surface of the copper, and a polarizing action set in which threatened failure. Lately M. Duchemin has substituted a cylinder of retort charcoal for the copper, with a plate of zinc suspended in the interior, the whole being connected by a crosspiece of wood and buoyed by means of cork floats. Several of these piles were thrown into the basin at Fecamp, and the results are thus described by the inventor:—"At the extremity of two conducting wires I could produce sparks, and during two months this new electrical generator worked an electrical bell without cessation until a Norwegian vessel by accident destroyed the buoy."

Further experiments led M. Duchemin to the conclusion that by multiplying the number of piles he could increase not only the quantity but the tension of the electric current. This was an unexpected result, and in a certain degree in opposition to the experience of the laboratory; but, as M. Duchemin says, the sea is a basin differing from those used in laboratories; the immensity of its extent, the chemical composition of its water, its incessant motion, all point to the probability of new laws to be studied. The nature of the water of the ocean may exercise a great influence on our planet, and the study of this may possibly change our received ideas respecting the currents which affect the compass. Admitting that the vast basins of the sea are in contact with land containing metallic principles, electric currents may be thus formed which will explain the magnetic action of the earth on the needle.

M. Duchemin has succeeded in convincing the French Government that the destructive action of sea water on metals may be made to produce electrical currents for useful purposes, and experiments are now being carrfed on to test the subject at the cost of the Marine Department; experiments tried during the summer of 1866 gave promising results, and at the end of last September M. Duchemin was summoned to Cherbourg to assist the commission in its labors. An experiment has been made before the President of the Marine Council of Works, with three elements, each about the size of a man's hat plunged in sea water, at Paris, and a sufficient electricity was produced to keep a Ruhmkorff coil of 16in. in action, and produce sparks of two-fifths of an inch in length. At Cherbourg the currents of seven elements plunged in the sea, after having traversed more than a hundred miles of copper wire, made a needle deviate 8 deg.

The Cherbourg commission entered upon another kind of experiment to ascertain whether these marine piles would not protect iron from oxidation. When an iron plate, of which the surface had been cleaned, was placed in connection with the positive pole it soon became completely oxidized, but it remained unaffected when attached to the negative pole. Seven elements of 16in. in circumference sufficed to protect an iron plate having a superfices of several square yards for an entire year, and at the end of that period the elements themselves were in good working order. The experiments made tend to show that the zinc employed in his marine piles is capable of preserving from oxidation a surface of iron equal to eighteen times its own; but as the chemical effect depends on the number of pairs, M. Duchemin believes that a much higher result still is to be obtained, the commission having at present employed but a very small number of elements.

How (asks M. Duchemin) is the different action of the two poles on iron to be explained? The oxygen obtained by electrical action on water possesses energetic principles for oxidizing metals, the hydrogen produced in like manner possesses the contrary power, which, however, is not evinced by hydrogen prepared in the usual manner. A current of ordinary hydrogen passes through a weak solution of perchlorure of iron containing a small quantity of ferricyanide of potassium without producing any effect, while a current of hydrogen produced from sea water produces a deposit of Prussian blue.

A somewhat similar effect is observed (says M. Duchemin) in the perchlorure of iron pile invented by himself and used at M. Oudry's great galvano-plastic works at Passy; in this pile the nitric acid is replaced by liquid perchlorure of iron and the acidulated water by sea water. The advantage of this over the Bunsen pile is that it does not disengage hypoazotic gases which are injurious to gold and silver deposits.

Among the proposed applications of the marine pile is the preservation of the plates of ships lying in harbor, where (says M. Duchemin) they suffer infinitely more than at sea. Nothing, he says, is necessary for the preservation of the armor plates than to ensure communication between every part of the cuirass and the negative pole of a powerful pile placed in each basin.

The other applications to which the marine pile may possibly be adapted are:—The explosion of submarine mines and torpedoes, experiments with both having been made by the marine administration; the cleaning of ships' bottoms, which M. Duchemin proposed to effect by connecting one pole of a Ruhmkorff coil with the iron plating of a vessel and the other with the sea, which causes the molluscs to quit their hold; the transmission of instructions on board ship; the signalling the depth of water in ports and other places, such as beneath the keels of vessels; the transmission of electric telegrams from ship to ship during naval engagements; for night signals, with the aid of the coil, together with Geissler's tubes; for engraving plates in sea water by the means of cutting out as with acids; and, lastly, the possibility of using the marine pile not only for illumination of lighthouses and beacons but also on board ship.—*The Engineer.*

Deodorizing and Refining Saccharine Fluids.

William Clough, of Cincinnati, Ohio, has patented a process which consists in the use of soluble silica or the soluble silicate of soda or potassa as a refining agent, and finely ground barytes or other appropriate heavy powder, the latter being used to give gravity to the precipitate or coagulum produced by the former. In operating upon saccharine fluids which have been reduced to the density of sirup or molasses, they should be first diluted to the consistency of semi-sirup, say to 20° Baumé, or less. Molasses of the tropical cane may be treated at a greater density than the more viscid sirup of sorghum. With the latter I have found it best to dilute to about 16° Baumé. If the refining process is to be applied in the original operation of making sirup or sugar from the green juice, it may be applied at any state of concentration not much exceeding the density above named.

To the solution, either cane juice, beet juice, or dilute sirup, first add the barytes or other heavy powder, thoroughly stirring it into the fluid. The quantity to be used need not be definitely stated, as the powder is employed simply for the purpose of giving gravity to the precipitate which is produced by the silica, and causing it to subside. With barytes I usually add enough to produce a visible hue of white upon the liquid—a solution of considerable density, say of 16° or 18° Baumé, requiring about one tablespoonful to a gallon. If an earth or powder of less specific gravity is used, the quantity must be greater to produce a corresponding effect. With solutions of less density, less of the powder is required. A heavy powder, like barytes, causes the impurities or separated matter to subside into a small compass, and this should be preferred, unless, for other purposes, bone, coal dust, or some other powder should be employed. After adding the powder the fluid should be tested with litmus paper, and if free acid is indicated, this should be neutralized with lime or other alkaline agent.

The solution of silica or silicate is next to be added. It is better to have this agent prepared in a dilute state, say at a density of 5° or 10° Baumé, as in this form it is more conveniently mixed and incorporated with the fluid. The quantity of silica appropriate to be used varies considerably with different solutions. It is best to use no more than will suffice to refine thoroughly. I have found that with solutions of sixteen to eighteen degrees' density, one part of silicate of ten degrees' density to one hundred parts of the solution, answered well. Silicates of different manufactures differ considerably in their capacities, some being much more silicious. Sirups or solutions of less density require smaller proportions of silica. Very impure viscid sirups yield a dense precipitate, and refine quite clear with smaller proportions of silica than are required for comparatively pure sirups. As it is not practicable to give exact quantities or proportions adapted to all circumstances, the operator, when employing the process for the first time upon any particular kind of fluid or sirup, should test the same in a small way before proceeding with a large operation. For this purpose an ordinary test tube, or a thin, white glass vial, which will bear to be held in the flame of a lamp, will answer. Fill this with the prepared solution and boil it. A perfect coagulation should appear as the liquid comes to the boiling point. In a very few minutes the separated impurities should subside, leaving the fluid perfectly clear. If this occur, and if the impurities settle into a small, compact mass at the bottom, the proportions may be understood to be correct. But if the precipitate is without cohesion, and in settling leaves the solution somewhat turbid and impure, the quantity of silica was insufficient, and more must be employed; but the additional quantity may be very little to produce the desired effect. On the other hand, should the precipitate appear dense and settle sluggishly, forming a bulky sediment, it may be understood that an excess of silica is present, and the relative proportion must be reduced.

The solution having been treated for refining, as has been explained, is next to be brought to the boiling point, after which it should be removed from the fire into settling tanks, and allowed to remain quiet until the impurities subside, after which the clear liquor may be drawn off from above the sediment, and is then ready to be boiled down to a proper density for sugar or sirup. The silica or silicate may be added to the solution before it is neutralized with lime, if more convenient.

The Photographic Bath.—Mr. J. R. Johnson lately read a paper before the London Photographic Society in which he states that permanganate of potash may be used with success in treating old baths. This salt appears to have the property of oxidizing the reducing agent contained in the bath which produces fogging. A few drops of a 20-grain solution of pure permanganate of potash is to be added to the bath which changes it to purple, then turbid brown, but on filtration the bath is rendered clear, completely cured of fogging and yields vigorous pictures. This appears to be a most useful suggestion for photographers.

Glycerin Paper.—M. W. Brown, of West Farms, N. Y., has a recent patent for steeping paper in a mixture composed of 100 parts of glycerin and 10 parts of saleratus. The paper is used for wrapping tobacco, snuff, soap, etc.

Pouillet has made observations with a pyrheliometer from which he estimates that the amount of heat annually received by the earth from the sun would melt a crust of ice surrounding the earth 101 feet thick.

Business and Personal.

The charge for insertion under this head is one dollar a line.

For Improved Lathe Dogs and Machinists' Clamps, address, for Circular, C. W. Le Count, South Norwalk, Conn.

Brick Machine.—Lafler's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Lafler & Co., Albion, Orleans county, N. Y.

Manufacturers of thick Water-proof Paper send address or price list to Box 109, Black Hawk, Colorado Ter.

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

For Patent Engine Lathes and Upright Drills, Planer Centers, Lathe Chucks, Planer Chucks, and all kinds of Cutlery Machinery, address Thomas Iron Works, Worcester, Mass.

For sample of a neat little Self-lighting Pocket Repeating Cigar Lighter, with wholesale price, send 65c. to L. F. Standish, Springfield, Mass

Two Valuable Patents for sale—one for a Fertilizer, and the other for Harness Wardrobe. Address H. E. Pond, Franklin, Mass.

Bartlett's Reversible Sewing Machines are the cheapest reliable Machines. Bartlett Machine and Needle Depot 569 Broadway, N. Y

Merriman's Patent Bolt Cutters—Best in Use. Address, for circulars, etc., H. B. Brown and Co., New Haven, Conn.

For all sizes of Tube for Steam, Gas, or Water, and the most improved Tools for Cutting off and screwing the same, address Camden Tool and Tube Works Co., Camden, N. J.

Waugh's Combined Circle and Square Shears for Tinners and Paper box Manufacturers. For circular address J. Waugh, Elmira, N. Y.

To Inventors.—I will furnish money to obtain and sell a patent on some useful invention if sufficient inducements are offered. Address J. K. Ross, Noblesville, Ind.

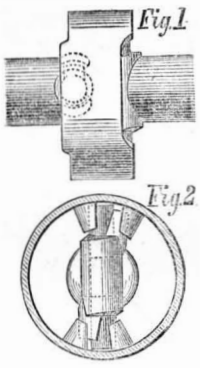
Agents wanted to introduce our flexible shoe brushes. Sample and terms sent on receipt of one dollar. Address Flexible Shoe-brush Co., Newark, N. J.

Will every inventor of improvements in Knitting Machines, please send their address to Dana Bickford, Boston, Mass.?

Manufacturers of improved machines for fluting zinc for Washboards, please address Eggleston & Green, Grand Rapids, Mich.

For Sale—one 8 and one 10-horse portable engine and boiler in perfect order. Address J. C. Beers, Tarr Farm, Venango county, Pa.

ZWIEBEL'S IMPROVED UNIVERSAL JOINT.



The "knuckles" or universal joints on thrashing and other machines for producing a rotary motion at an acute or obtuse angle from the driving power, are made of iron, cast or wrought, and some of them are dangerous because of projecting pins, and not durable because of the rigidity of the material of which they are constructed. This "knuckle" will last longer than one made entirely of iron; the wooden pins may be replaced by new ones when worn out; and the wear is actually less than on the iron joint. Fig. 1 shows a side perspective view, and Fig. 2 an end vertical section which sufficiently illustrate the construction and operation of the device. It was patented through the Scientific American Patent Agency Sept. 3d, 1867, by Anton Zwiebel, dealer in farm and agricultural implements and machines, Burlington, Wis., who will reply to all communications relative thereto.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The residents in and around West Hampton, Long Island, have been sorely perplexed of late concerning an extensive establishment just erected on their sea beach, of whose objects nothing can be learned. They may thank us for the supposition that the mysterious Algæ Chemical Works probably purpose to undertake the extraction of iodine, bromine, etc., from the seaweed so abundant on their coast. We are informed that this spot was selected for the location of their works, as the best result of tests applied along the coast from Montauk Point to the Florida Keys.

A locomotive built in Pittsburgh, designed for the use of an Ohio coal and iron company, weighs but five and a half tuns; has neither pitman nor connecting rods, the power being transmitted directly from the piston to the driving wheels. The gearing can be so set as to give, with a velocity of ninety strokes a minute, a speed of only three miles an hour—if that is any advantage.

The town of Newport, on the Maine Central railroad, possesses a very valuable water power. Lately, the town has exhibited a commendable spirit of enterprise in taking the initiatory steps toward gaining for itself a manufacturing importance, by voting to take stock to the amount of $10,000 in a cotton or woolen mill built on this water site, and to exempt the establishment (capital $40,000), from taxation for ten years.

The manufacture of cotton has been begun in Utah, as appears from an advertisement in a Salt Lake City paper, to the effect that the faithful "can now purchase the justly celebrated Desert Mill cotton yarn, manufactured at President Young's cotton factory."

The State of Arkansas proposes, by virtue of its mineral resources, to enter the mining field. In the three northeastern counties of Lawrence, Independence, and Randolph, sufficient quantities of zinc, copper, and lead have been found to warrant the organization of mining companies for the purpose of carrying on operations on an extensive scale. One company in the first-named county sunk a shaft but a few feet, and were rewarded with a lump of zinc weighing four thousand pounds.

Although "big strikes" are now much less common in California than in the earlier days of gold mining, yet the discovery, in 1867, of several remarkably large nuggets is recorded by the San Francisco *Commercial Herald*. In August, three lumps of nearly pure gold were picked up at You Bet, the united weight of which was 539 ounces, valued at $10,000. In February, a nugget of pure gold was found in Mariposa county, which weighed nearly four pounds. A gang of Chinamen working in the vicinity of Kanaka Flat, took out in the month of July a piece of gold weighing forty-five pounds, worth over $15,000. The next week another company of these people picked up, near the same place, a chispa weighing forty-one pounds. We have made no note of the discovery of *morceaux* of $1000 value, or under, but the instances given are sufficient to show that these lucky strikes, though exceptional, are sufficiently common to encourage the unfortunate miner to hope for better things.

Commissioner J. Ross Browne estimates the yield of precious metal for 1867, in the State and Territories west of the Rocky Mountains, at $75,000,000. The entire product of the same section in precious metals, from 1848 to Jan. 1st, 1868, amounts to $1,165,000,000. Over 77 per cent of this yield was contributed by California alone. Placer mining is on the decline. Vein or quartz mining is progressing favorably. The proportion of the population actually engaged in mining has greatly diminished in the past few years, and does not now exceed fifty thousand. Agriculture, manufactures, and commerce are assuming the preponderance over the mining interests.

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Track laying, which was suspended on the Kansas City branch of the Union Pacific Railroad, during the winter, is again resumed. By the first of June next the cars will be running to Fort Wallace, three hundred and eighty-five miles west of Kansas city.

In order to approach the railway bridge over the Mississippi, connecting Dunleith with Dubuque, the Illinois Central railroad have found it necessary to undertake the boring of a tunnel 900 feet long, through solid rock. This formidable undertaking has been let to the Rock Island contractors, and they have already commenced operations.

In the city of Pittsburgh and its immediate vicinity, more than twenty million dollars are invested as capital in coal oil refineries and their appurtenances. There are fifty-eight refineries in operation, with an estimated capacity of 27,000 barrels per week, or 1,404,000 barrels per year—equal to a product of over 63,000,000 gallons per year, while the entire export of oil in 1867 was but 3,000,000 gallons more.

An air line railroad from New Orleans to New York is one of the latest and most promising of railroad projects. The gap of communication now existing between Selma, Ala., and Dalton, Ga., is nearly finished, and anticipating its completion the president of the Selma and New Orleans road is having a route between those two points surveyed. So much interest is taken in the project that he reports a million acres of land will be easily obtained to form a basis of operations. The proposed line from New Orleans, with its direct connections through to New York, would shorten the distance between these cities by 170 miles.

The Green River works at Greenfield, Mass., is the oldest cutlery establishment in the United States, and one of the largest in the world. Giving employment to nearly 600 hands, the daily product average 84 gross of table cutlery, 130 dozen ivory do., and 250 dozen of miscellaneous goods. As raw material, over 600 tuns of steel; 30,000 pounds of brass, and 7,500 pounds of iron wire; 400,000 pounds of grindstones, and 44 000 pounds of emery, are annually consumed.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

VISE.—Mason Prentiss, Cambridge, N. Y.—This invention relates to a new and useful improvement in vises for holding either iron or wood work, and it consists in an arrangement whereby the back jaw of the vise is made adjustable, so that tapering or wedge-shaped pieces of iron or wood may be held between the two jaws.

LUBRICATING DEVICE.—Mathew Senior, Frankford, Pa.—This invention relates to a device for lubricating the feather of a shaft, which has a longitudinal as well as a rotating motion imparted to it for certain mechanical operations.

LAMP BURNER.—Samuel Shea and E. W. Gillman, Long Island City, N. Y. This invention relates to a new manner of hanging the arbor of the ratchet wheel in coal-oil lamp burners, and consists in hanging one end of the same in a sliding sleeve which can be turned so as to allow the ready removal and reinsertion of the said arbor.

BED BOTTOM.—Ezra Caswell, 2d, Lyons, N. Y.—This invention consists in the use of a clamp, which is secured to the end of the slat, and which has a slotted bar for receiving the ends of the rubber strap, by means of which the slat is suspended. Through the looped ends of the strap is fitted a bent rod, the ends of which are fitted over hooks that are secured to the side of the bedstead.

VENTILATOR AND WINDOW SCREEN.—John R. Wharry, Moundsville, W. Va.—This invention relates to an improved ventilator and window screen, and consists in a frame of wire netting fitting beneath the outer and upper sash.

SUPPOSITORIES.—Henry H. Seys, Oil City, Pa.—This invention relates to a new and improved method of treating certain diseases of the human body, and consists in the composition of a suppository which when introduced into the rectum shall act mechanically in returning hemorrhoidal tumors and prolapsed portions of the anus, and returning the extruding parts in place by pressure upon the blood vessels.

TANNING AND COLORING LEATHER.—Jonas Diehl, East Freedom, Pa.—This invention relates to an improvement in tanning and coloring leather, more especially sheep skins with the wool on, and which are used for mats and similar purposes.

MACHINE FOR CUTTING SAW TEETH.—James Morton, Philadelphia, Pa.—This invention relates to a new machine for cutting the teeth of saw blades, curry combs, or other metal plates, and consists in the use of two revolving circular dies, between which the article to be toothed is fed. The dies are provided with toothed peripheries, the teeth being shaped according to the pattern to be cut.

HORSE RAKE,—B. W. Davis, Fort Madison, Iowa.—This invention relates to a new device for connecting the shaft to the handle of the ordinary rotating horse rakes, whereby the same are connected in a more simple, convenient, and durable manner.

GANG PLOW.—Wm. Nelson, Cacherville, Cal.—This invention relates to an application and arrangement of the plow beams, whereby the plows may, with the greatest facility, be raised entirely out of the ground when necessary, as, for instance, in turning the machine at the ends of furrows, moving it from place to place, etc., and the plow at the same time rendered capable of being firmly secured in position, so as to plow at any required depth, and also adjusted at a greater or less distance apart, as circumstances may rerequire.

INSECT DESTROYER.—Alexander McKenzie, Henry, Ill.—This invention relates to a useful improvement in the treatment of fruit trees, for the destruction of the vermin which prey upon and injure or destroy the trees, or the fruit thereon.

HARNESS TRACE.—Robert J. Steele, Jr., Rockingham, N. C.—This invention consists in constructing a trace entirely of iron, steel, and other suitable metal, and in such a manner as to supercede leather, or leather and chains combined, which have hitherto been exclusively used.

FUNNEL AND GRATER.—E. A. Goodes, Philadelphia, Pa.—This invention relates to the peculiar construction of a funnel, whereby it is adapted to various purposes, and consists in so forming and constructing the article by corrugating, serrating, and punching, that it is made applicable to a variety of uses.

ATTACHMENT FOR SEWING MACHINES.—C. H. Lockwood, Hawleyville, Ct. This invention relates to an attachment for sewing machines, for the purpose of sewing hat tips to side linings, and consists of a clamp arranged in such a manner as to be capable of being rotated by the feed mechanism of the machine, and so constructed as to keep the lapped edges of the tip and side lining in contact, while, by the rotation of the clamp, the lapped edges are fed underneath the needle of the sewing machine each time the former rises above the tip and side lining.

HUBS, BOXES AND AXLES.—John W. Pollock, Cross Bridges, Tenn.—This invention relates to a new and improved method of constructing and combining the hubs, boxes and axles of wheeled vehicles, whereby the same are rendered more durable and convenient.

WASHING MACHINE.—Edmund Stair, Harrisonville, Mo.—This invention has for its object to furnish an improved washing machine, simple in construction, easily operated, and which will do its work quickly and well without tearing or injuring the clothes.

BARK LEACH.—S. J. Patterson, Bridgeport, Conn.—This invention has for its object to furnish an improved leach for leaching bark and other substances which shall be simple in construction, easily operated and effective in operation.

PLATFORM RAKE.—Elias Ogden, Lynchburg, Va.—This invention has for its object to improve the construction of platform rakes for reapers so as to make them more convenient and effective in operation.

HAY GATHERER AND CONVEYOR.—John S. Coffman and Manassah Greybill, Greenville, Ind.—This invention consists in constructing a machine by which hay in the field may be gathered and deposited on a platform and conveyed to the barn or other desired location.

RAILROAD FREIGHT CARS.—L. Savage, Ashtabula, Ohio.—This invention has for its object to so improve the construction of freight cars that the train need not be long detained in loading and unloading, that the necessity of side tracks and switches may be greatly lessened, and that the road can do a much greater amount of freighting business with the same amount of rolling stock than it can do when the cars are constructed in the ordinary manner.

HOLDER FOR PENS.—Isaac W Henderson, Leavenworth, Kansas.—This invention relates to a holder for pens, more particularly intended to be used for the fancy ruling of paper and other sheet material in the manufacture of blank books. This holder is constructed in such a manner that the several pens which it carries can be adjusted to any required distance apart and the center pen to rule a line that will be parallel to and equidistant from each of the outside lines ruled by a double or two single pens suitably inserted in the pen holder therefore.

CAR WHEEL.—S. B. Chapman, New York city.—This invention relates to a wheel for railway cars, and it consists in a novel and improved manner of constructing the wheel, whereby several advantages are obtained over the ordinary cast-iron wheel, to wit: the avoidance of breakage and the consequent accidents arising therefrom, an entire cast-iron wheel being very liable to crack; a diminution of the wear and tear of the rails and rolling stock, the latter not being subjected to the jars and concussions which they receive when on the ordinary cast-iron wheels; greater durability and economy, the length of time my improvement will last or run rendering them far less expensive than the ones now in use.

VEGETABLE MASHING AND CUTTING MACHINES.—Carl C. Vignal, New York city.—This invention relates to a new apparatus for mashing or cutting all sorts of vegetables or other suitable material and consists of a hollow conical grating or cutting roller mounted on a horizontal shaft with open large end, and of a concave shield set opposite the open end so that when the cone is revolved and the article to be cut or mashed held against its surface the detached particles will enter the cone through perforations in its shell and will either fall down on its lower inclined inner surface, or will be thrown against the shield and will by the same be conducted to the receptacle into which they fall directly from the cone.

CARD HOLDER.—W. Inck Adams, New York city.—This invention relates to an improved holder for cards, labels, etc., and is more especially designed for use upon traveling trunks, boxes, and other similar cases. This holder consists of a frame that at one end is open so as to allow a card or label to be inserted therein where by means of a spring plate arranged within such frame and to the back of the card it is held and retained against accidental loss or escape the said plate being depressed when the card is to be removed.

STUMP EXTRACTOR.—Soloman S. Avis, Pennsgrove, N. J.—This invention is for the purpose of extracting stumps, and is more particularly adapted for the extraction of light stumpy growth of newly cleared land. It consists of a trestle horse, composed of a beam having legs which rest on and are affixed to pedestal planks, for the purpose of preventing the legs from sinking into the soil when the same is soft and yielding.

EXTENSION WARDROBE.—J. G. Roux, Crystal Springs, Miss.—This invention consists in so constructing a wardrobe that the two halves of the same, standing vertically, can be separated horizontally by turning a crank on its top, thus exposing uprights provided with hooks or pegs for hanging clothes upon. The object is to obtain a wardrobe easy and convenient of access, in which the articles placed in it can be exposed to view, and for selection, or closed for security, both operations being performed with facility. It is designed more particularly for merchants, though quite practicable and desirable for household uses.

AGITATING MOTION.—Samuel Thompson, Ballston Spa, N. Y.—This invention relates to the production of a certain violent agitating motion, applicable to a variety of purposes, as the screening of salt where the riddle or screen frequently becomes clogged or choked, and to which it is especially liable when the salt is green or damp.

MODE OF FORMING RAISED ORNAMENTS UPON WOOD.—J. B. Macduff, New York city.—This invention has for its object to furnish an improved, simple, and convenient mode, by means of which letters, scrolls, or other raised ornaments, may be formed upon wood.

GATE.—Wilbur S. Wandell, Battle Creek, Mich.—This invention relates to self opening gates, and consists in so hanging and weighting the same that it will swing upward when the gate is turned horizontal, or its latch pin is liberated.

SEED PLANTER.—Silvanus C. Wilder, Sardinia, Ohio.—This invention has for its object to furnish an improved planter, in which the dropping device shall be so constructed and arranged as to be easily operated, and so as to drop the seed promptly and accurately.

COMBINATION DOOR LOCK.—Hiram Norton, Delton, Wis.—This invention refers to an improved method of constructing combination locks for doors, drawers, etc., and consists of two or more independent latches, which are hung by a pivot pin at a middle point, and are operated by a very small key, these latches catch into two notches on the bolt, thus preventing the movement of the latter.

HARROW.—M W. Gunn, La Salle, Ill.—This invention has for its object to furnish a simple, cheap, and durable harrow, designed especially for harrowing or cultivating crops planted in hills and drills, but equally adapted to every kind of farm harrowing, which shall be so constructed that its forward end may be easily guided so as to straddle the hills or rows, and the forward and rear ends of which may be easily raised to clear it of rubbish, or to pass over obstructions. Patented Feb. 11, 1868.

ADJUSTABLE ROCKER FOR CHAIRS.—L. B. Yale, Bainbridge, N. Y.—This invention relates to a rocker for chairs, and it consists in constructing the rocker of metal, cast or wrought, and of angle form in its transverse section, with a series of holes in it near each end, to admit the rocker being secured to the chair legs further forward or backward as may be desired. The object of the invention is to obtain a chair rocker which will not only admit of being adjusted as stated, but which will also be light, strong, and durable.

COTTON BALE TIE.—J. L. Sheppard, Charleston, S. C.—The main feature in this invention consists in making the tie of a single piece of metal of such a shape that the operator can fasten the hoop by inserting the end of it at one side of the tie, and turning the latter partially round.

SPOOL AND THREAD REGULATOR AND DIVIDER ATTACHMENT FOR SEWING MACHINES.—Solomon Snyder, Harrisville, Pa.—The object of this invention is to simplify and render more perfect the spool holding and tension devices of sewing machines, by which any kind of thread, whether even or uneven and whether prepared for the sewing machine or not, can be used without difficulty.

MACHINE FOR DRESSING FLAX.—Wm. C. McBride, Somerville, N. J.—This invention consists in a novel arrangement and construction of the beaters, which are so made that they will thoroughly beat and dress that end of the flax which is exposed to their action.

BELTING.—Mrs. H. Lemaistre, Brussels, Belgium.—This invention relates to a new method of forming the ends of the leather straps which compose a belt for machinery, and also in a novel composition for cementing the straps.

FEED CUTTER.—Truman P. Allen, Gowanda, N. Y.—This invention has for its object to furnish an improved feed cutter, simple in construction and effective in operation, doing its work with a less expenditure of power for the amount of work done than other machines now in common use.

GRAIN AND GRASS HARVESTERS.—Lorenzo Wallace, Leavenworth, Kansas.—This invention relates to a new means employed for operating or dividg the sickles of grain and grass harvesters, whereby the power is taken direct from the driving or supporting wheels of the machine, and a diminution of friction and consequent saving of power effected. The invention also relates to an improvement in the cutting devices of harvesters, whereby grass or grain may be cut with less power and greater facility than by the usual cutting device.

HORSE POWER SAWING MACHINE.—Henry Tarpley, Wesley, Ky.—This invention relates to an improvement in that class of sawing machines which are used principally for sawing down standing trees and sawing logs into cord wood, and which are driven by horse power. The invention consists in combining a horse power with the sawing machine in such a manner that a horse can be made to propel the machine from place to place where required, and, when the machine is at the desired spot for work, the horse made to drive the saw.

SEED PLANTER.—R. B. Wright, Vermillion, Ill.—This invention relates to an improvement on a seed planter granted to this inventor Feb. 26, 1867. The present invention consists in a new and improved manner of operating the seed slides, arrangement of driver's seat, wheels, and a chain step, whereby several advantages are obtained over the original patented machine.

VERMIFUGE.—John McKinsey, Millville, N. J.—This invention and discovery relates to a new composition or medicine designed to expel worms from the human system.

CAR TRUCK.—Joseph Baysore, Freeport, Ill.—The object of this invention is to construct a truck and adapt or apply it to a car in such a manner that in the event of the breaking of a wheel or axle, the truck will be sustained in position and the car prevented from being thrown off the track, a contingency which almost invariably occurs when the axle or wheel of a truck breaks or gives way.

WHEAT AND COCKLE SEPARATOR.—W. T. Chaffee, Richmond, Va.—This invention has for its object to furnish an improved machine designed especially for separating wheat and other grain from cockle, partridge pea or berry, and other small seeds, and for separating seeds, and for separating the large full kernels for seed from the smaller kernels, which shall be simple in construction, easily operated, and effective in operation.

MINERAL WATER JARS AND BOTTLES.—A. D. Schnackenberg, Brooklyn, N. Y.—This invention relates to a new manner of constructing the head or stopper of a mineral water jar or bottle, of that class from which the liquid is discharged by the pressure of gas when a valve is opened, and the invention consists in arranging a straight pipe through which the liquid is filled in and discharged, so that its outer end is higher than its lower end, and in combining it with a valve stem in such a manner that the liquid can be filled in when the bottle is standing, and can be discharged by turning the bottle up and opening the valve. Thereby the use of the draft tube generally used in mineral water bottles is dispensed with, and the cost of the apparatus is considerably reduced.

LAMP BURNER.—E. B. Requa, South Bergen, N. J.—This invention relates to a lamp burner for burning coal oil or petroleum, and of that class in which a cylindrical draft chimney is used and a great portion of the wick tube exposed. The present invention consists in a peculiar construction of the cone or deflector with a perforated plate, whereby three very important results are obtained, namely, the supplying the base of the flame within the cone with a requisite amount of oxygen; the supplying the upper part of the flame above the cone with a requisite amount of oxygen; and the keeping of the wick tube in a cool state, so as to prevent a too rapid evaporation of the oil. These three conditions being attained, a brilliant illuminating flame is the result, and explosions effectually guarded against.

STUFFING HORSE COLLARS.—E. B. Miller, Greenville, Tenn.—This is an improved machine for stuffing the leather rim or roll of horse collars with straw, in which the invention consists in an improved feeding device, a new method of operating the machine, and a new method of holding and adjusting the collar, by which it can be more evenly filled than by hand,

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

E. L., of N. J.—"What are the ingredients of the common brown or yellowish brown japan or varnish used on tea canisters and other articles of tin ware?" It is a lacquer made simply of japan and bronze powder.

A. C., M. D., of Wis., replies to the query of F. R., of N. Y., in No. 12, current volume, that he makes gunpowder for his own use of 1 part prussiate of potash, 1 part white sugar and 2 parts chloride of potash. Let the ingredients be separately reduced to a fine powder, and then mixed by the hand or in a mortar; or they may be moistened with water and granulated by passing the mixture through a sieve. He says; "I find it will throw shot or rifle ball twice as far into timber as the best powder found in the market, and it leaves very little sediment and does not foul the gun," The principal objection to the preparation and use of this powder is its danger in handling.

J. M. C., of Pa., says that if M. J. W., of N. Y., whose inquiry in regard to the transmission of power for long distances appeared on page 147, current volume, will cross his rope setting up a post at the intersection of the belt to divide the two parts he will find it to last two years instead of one. The faces of the post may be covered with some smooth, anti-friction material. H. A. W., of N. C., asks, "what is the objection to the old plan of a shaft with three cranks, each crank connected to a similar one on another shaft by a rope? It would require fifty per cent more rope, but this would be more than counterbalanced by the saving in the wear of the ropes, as they would nowhere come in close contact." This device is old but not always practicable as the tension of one rope over that of another necessitates frequent taking up. Probably nothing is better for transmitting power for long distances than a continuous shaft, which may be run under, as well as above ground.

E. R. S., of Tenn.—Will some of your correspondents inform your readers as to the proper method of drying or seasoning timber such as oak, ash, hickory, etc., to give it strength and durability; whether it should be stacked under shelter to let nature have its course or whether it should be steamed, boiled, or subjected to the heat of a kiln. Also the best time for cutting timber, looking to its durability, etc." Pianoforte makers who require perfectly seasoned wood, subject it to a kiln drying process.

S. G. T., of Ohio.—Piano cases and other specimens of highly finished wood are varnished and stoned repeatedly to produce the effect. Pumice stone and rotton stone are used and a flowing coat of the finest varnish finishes the process. . . For a tumbling box for cleaning malleable iron castings, use scraps of leather if a bright finish is desired.

G. W., of Ill.—You ought to place the results of your investigations before the scientific world; a repetition of your experiments by others would soon show how far you are correct or not. We cannot dispose of time sufficient to verify them, and therefore abstain from giving any opinion on the subject. The explanation of all the phenomena of electricity on some simple principle, like that of attraction, is what physicists have long sought, but mathematical difficulties are in the way which hitherto have not been overcome.

A. D., of Mo.—We confess that we are at a loss to understand the drift of your communication and to unravel the meaning of its somewhat obscure style. You speak about an hypothesis without propounding it and of a fact without stating it. If your intention is, as you say at the outset, to prove that the inclination of the earth's poles really belongs to its orbit, we can only say to you that the inclination of the poles is a fixed *fact* the existence of which is attested by many phenomena and observations; and facts cannot be *reasoned* out of existence. If you consider our present astronomy wrong, two ways of correcting it are open to you; you will either have to bring forward *observations* which directly contradict the results and consequences of its theory, or you will have to overhaul it *mathematically*, do away with gravitation and show up the incorrectness of the reasoning and of the demonstrations of the astronomers since Newton's time. Until you have accomplished this we advise you to reject as false every hypothesis which would lead you to conclusions at variance with established facts.

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Improvement in Turbine Water Wheels.

The Jonval turbine water wheel is too well known to millwrights and mechanics, generally, to need any description of its action or statement of its advantages. But still, practical men, understanding its obvious superiority, have been satisfied that it did not yield all the results of which the principle on which it is constructed was capable. This has led to a number of modifications and many improvements, one of which is shown in the accompanying engravings.

The wheel is double, or in two sections, the buckets of each being curved in opposite directions. The inventor says the peculiar form of bucket is one of the advantages he proposes to gain. The inside edge of the bucket falls in a radial line about three inches to the foot of its radial length—although he does not propose to be confined to that proportion—the fall diminishing in proportion up to a horizontal plane at the top. When the bucket is set in position in the wheel a line drawn from its lower end inclining three inches to the foot until it intersects a perpendicular line in the center of the wheel, and another line on the horizontal plane of the top of the bucket intersecting the center line, give a distance on the perpendicular line which, spaced off into ten equal parts, will show the points of intersection of a radial line drawn along the face of the bucket from each of these points which would intersect the perpendicular line. In other words the form of the bucket can be comprehended if the bucket be extended to the center of the wheel when it would terminate in a perpendicular with a twist of three inches in twelve. By this form it is believed that a portion of the centrifugal or tangential force of the water now wasted in other wheels is economized and utilized.

Another advantage of this device is a balanced water gate, A, forming two openings, requiring no packing and having no friction except in the bearings of the stem on which it swings. It will operate easily under pressure. Its peculiar construction is seen in the horizontal section, Fig. 2.

The inventor claims still another advantage in the form of the curb having a corner at right angles or tangent to its sides so that the entering water will gyrate with the wheel before striking the buckets. The man-hole plate, B, Fig. 1, may be either hinged or secured by buttons as seen. The concave portion of the shaft, which rests on the step may be made separate and screwed on to the shaft acting as a nut to hold the wheel. Application for a patent is pending through the Scientific American Patent Agency by P. H. Wait, who may be addressed at Sandy Hill, N. Y., for further information.

Fig. 1

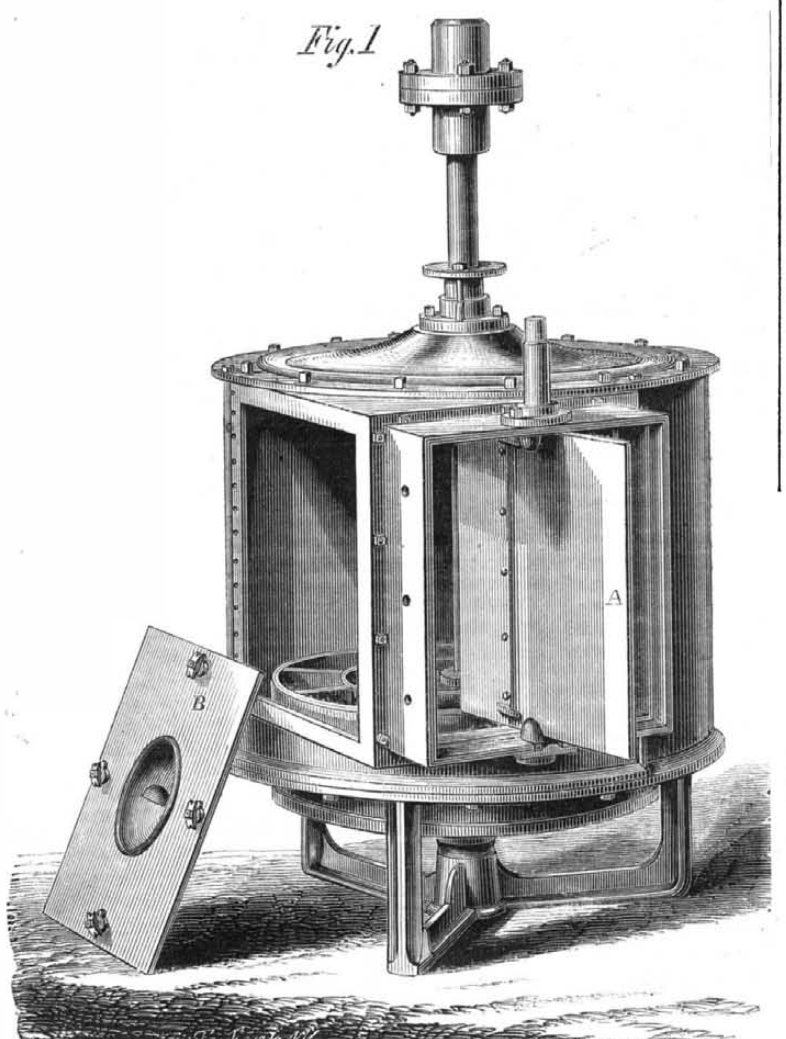
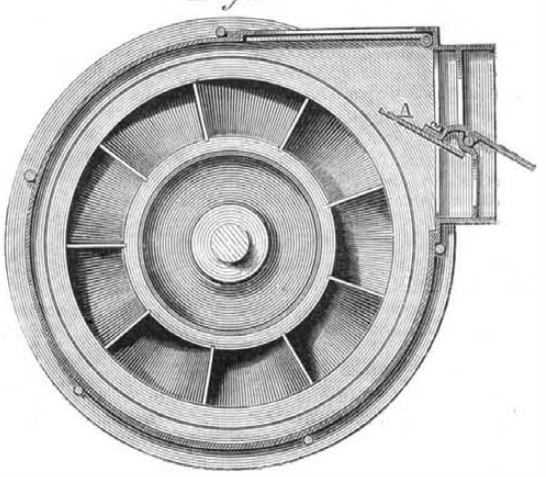


Fig. 2



WAIT'S IMPROVED JONVAL TURBINE.

Improvement in Table Cutlery.

The design of the improvement shown in the engravings is to adapt a table knife to the tea and dinner service by extending its length, thus saving the expense of two sets. Also, to utilize either the blade or handle, should one of them be broken, as they are two distinct parts not rigidly secured together as usual. It has also other advantages which may be readily appreciated; one is the underhang of the blade below the handle, and the other the space between the handle and the edge of the blade when the latter is extended, making, a handier implement than the table knife in general use.

The tang of the blade is of uniform size the whole length, and slides in a recess in the handle, as seen in the sectional view Fig. 2. On the top of the tang, at proper distance apart, are two notches, A, into which, when the blade is either closed or extended, the spring catch, B, shuts, holding the blade firmly in the position desired. The top of the catch is an oval or shield-shaped plate, silvered, which may be ornamented by engraving or receive the initials of the owner. With this device the dinner knife may be made the carving knife, or the tea knife the dinner knife.

Patented through the Scientific American Patent Agency Dec. 17, 1867, by N. W. Caughy, Baltimore, Md., who may be addressed relative to the sale of rights, etc. [See advertisement on back page.]

Fig. 1

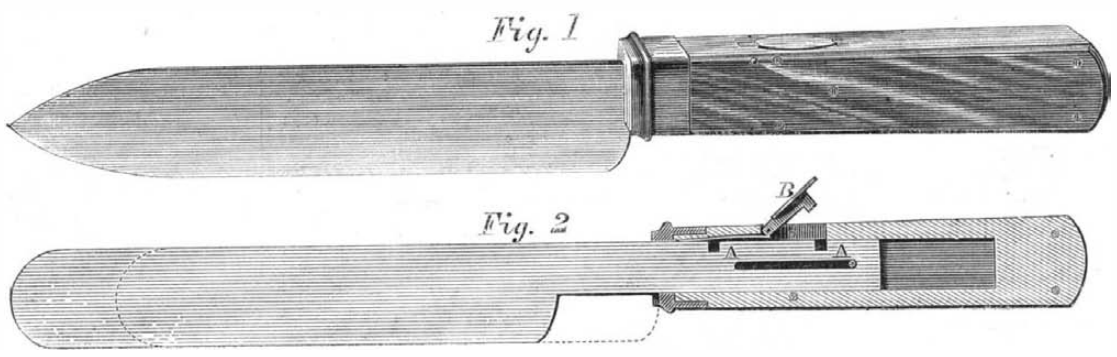


Fig. 2

CAUGHY'S EXTENSIBLE TABLE KNIFE.

Acid Phosphate of Lime.

The object of this invention is to obtain an acid phosphate of lime, which may be easily handled in a pulverulent form, and which may readily be obtained in liquid condition comparatively pure, when wanted. It consists in adding sulphuric acid to a solution of acid phosphate of lime in a solution of a salt of lime, the acid of which salt is volatile, by which the lime, in combination with the volatile acid, is combined with the sulphuric acid, and for the most part precipitated as hydrated sulphate of lime, and then driving off the volatile acid by heat, leaving behind acid phosphate of lime mixed with or feebly combined with the sulphate of lime, from which it may be separated in comparative purity by leaching.

The mode of manufacture is described by the inventor as follows:—"I dissolve to saturation common tribasic phosphate of lime, derived from bones or mineral phosphate of lime, in nitric acid of specific gravity 1.23, requiring two of nitric acid by weight to three of phosphate of lime, which gives a result of nitrate of lime and monobasic phosphate of lime, as expressed in the following formula: 3 Cal. Po_5+2 [Ho. no_5]=Cal. 2 Ho. Po_5+2 [Cal. no_5.] If the phosphate of lime contain impurities or the nitric acid be of other strength, a corresponding modification of the proportions must be made. To this solution I add two parts, by weight, of oil of vitriol, [Ho. So_3.] diluted with water to precipitate any sulphate of lead that may be present, and then siphoned off from the precipitate. This sulphuric acid combines with the lime of the the nitrate of lime, forming a precipitate of sulphate of lime, and leaving, besides a trace of the sulphate of of lime, monobasic phosphate of lime, and nitric acid in solution, thus: Cal. 2 Ho. Po_5+2 [Cal. no_5]+2 [Ho. So_3]+4 Ho=2 [Cal. So_3, 2 Ho.]+2 [Ho. no_5]+Cal. Ho. Po_5. I then drive off the nitric acid by gentle heat, adding toward the close a small quantity of water to facilitate the escape of the last traces of nitric acid. A current of warm air over the surface of the drying mass facilitates the removal of the water and volatile acid.

"I sometimes save the nitric acid by conducting the vapors into a suitable condenser. I sometimes add, after the volatile acid has all been expelled, a little lime solution, and dry off the water to correct any accidental excess of sulphuric acid, and to render the preparation more readily pulverulent, and more thoroughly non-hygroscopic. I sometimes replace a part or the whole of the nitric acid with hydrochloric acid.

"This preparation furnishes acid phosphate of lime in superior condition for medicinal and culinary purposes. Where the gypsum is not objectionable, the preparation may be employed as it is. Where the acid phosphate of lime alone is required, it may be separated by solution in water, and leaching. The mixture, being of definite composition, it may be weighed or measured as a powder, and then leached to get the acid phosphate of lime. When employed as a substitute for tartaric acid, in making bread, biscuit, etc., the proportion should be about two of the powder to one of bicarbonate of soda.

"The importance of phosphates to the animal economy, to be supplied through the food, has long been recognized. I have found the advantage to the health, of using the liquid monobasic acid phosphate, when employed in aid of digestion and assimilation, to be of the most marked character. Dyspepsia of certain forms is relieved by taking with the meals, a teaspoonful of the liquid acid phosphate, of specific gravity 1.17, in a glass of water. It may be used as vinegar, when I dilute the acid of the above strength with five times its volume of water, for ordinary household consumption. It may be employed as an ingredient in beverages, taking the place of lemon juice, on long voyages, to prevent the ill effects arising from the too long use of salt provisions, by supplying the phosphates of which the meats have been deprived; or it may be used as an ingredient in producing an effervescing draft, or in the composition of sauces; or, when mixed with flour, as a substitute for hydrochloric acid, in the process of Thompson, for decomposing bicarbonate of soda, in making bread light without the use of ferment.

"The acid phosphate I employ is generally a compound of one atom of lime with one atom of phosphoric acid, with a small addition of free phosphoric acid, and is prepared as follows:—I add to tribasic phosphate of lime, sulphuric acid, in the proportions described in my patents for producing acid phosphate of lime, for use in preparing self-raising flour, being about fourteen hundred parts of burned bones to one thousand parts of oil of vitriol. The sulphuric acid withdraws a little more than two atoms of lime from the phosphate, leaving monobasic phosphate of lime and a small portion of free phosphoric acid in solution, but mixed with gypsum. The solution is separated from the gypsum by leaching. I take the liquor thus separated as long as it runs of a specific gravity that will average 1.17. I do not propose to limit myself to this strength, nor to these proportions, but it is convenient to have a constant strength, and I have found this strength and the above proportions convenient for production in a large way.

"The liquid may be kept in glass or stoneware. In this form it is ready for use, or to be diluted to fit it for use where less strength is desired. Diluted with twenty times its volume of water, it may be employed to remove tartar from teeth, without injury to the enamel. It operates both as a very weak acid, and specifically to destroy traces of food lodged in the interstices between the teeth.

"In suiting the acid phosphate of lime to the wants above alluded to, the constant specific gravity of the liquid will be a guide. The acid phosphate of lime may be substantially replaced by the corresponding compounds of magnesia and potassa of soda, produced by the usual well-known chemical methods."

The above improvements have been lately patented by Prof. E. N. Horsford, of Cambridge, Mass.

Natural Aniline.

Mons. Ziegler, of Muhlhouse, has subjected to a careful examination the red coloring matter which is secreted by a mollusc (*aplysia depilans*), generally known as the sea hare which animal is not rarely found on certain coasts and is especially abundant on the coast of Portugal after heavy storms. The coloring matter has a peculiar odor and serves the animal as a defence against its enimies by rendering the water turbid and at the same time disagreeably odoriferous A chemical examination disclosed the fact that the coloring matter is aniline with a slight admixture of other organic substances, and that it can be easily obtained in a state of purity; but as the pound would cost about 60 francs this new source of aniline is practically without any value. The most interesting part of the article is the plausible suggestion of Mons. Ziegler that the sea hare and not the murex, as now generally believed, is the animal from which the Phœnicians obtained their famous purple, and thus it is rendered probable that the priceless purple of Tyre, the only dye thought fit for the imperial vestments of Ancient Rome, is identical with the cheap coal-tar aniline of modern manufacture.

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NEW YORK, SATURDAY, APRIL 4, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improvement in Corn-Shelling Machines	209	Manufacturing, Mining, and Railroad Items	214
Iron and Chromium and Chromium Steel	209	Recent American and Foreign Patents	215
*Davenport's Patent Low Water Alarm	209	Answers to Correspondents	215
Composition for Coating Wood, Iron, Paper, etc.	209	*Improvement in Turbine Water Wheels	216
Editorial Correspondence	210	*Improvement in Table Cutlery	216
Improved Concrete Pavement	211	Acid Phosphate of Lime	216
Clock Repairing	211	Natural Aniline	216
*Curious Optical Effect	211	Explosive Oils—Kerosene and its imitations—Dangerous Compounds	217
Colorless Drying Oil for Paint	211	Proposed Reduction of Patent Fees	217
How to Catch Rats	211	The Blowpipe—Its Uses	217
The Value of Dried Potatoes	211	The Distribution of Sodium in Nature and the Value of its Compounds as Manure	217
Self-Adjusting Telegraph Magnet	211	Adhesion of Leather Belts to Cast Iron Pulleys	218
*Heat and Cold	211	Platinum and Platinizing Metals	218
*Cole's Method of Raising Water	212	Separating Fibers from Wood and Other Substances	218
*Improved Device for Oiling Loose Pulleys and Gears	213	Area of the States and Territories	218
Glycerin and Yolk of Eggs	213	Our Apprentice System	219
An "Elephant" Indeed	213	Swinging the Circle with a Grape Vine	219
*Improvement in Turning and Planing Tools	213	Artifical Wine	219
*Improvement in Portable Fences	213	Patent Claims	219, 220, 221, 222
Glycerin	213	Pending Applications for Reissues	222
Compound Baths for Hardening Steel	213	Inventions Patented in England by Americans	222
Cleaning Cloths Used by Bank Note Engravers	213		
Electric Marine Buoys	214		
Deodorizing and Refining Saccharine Fluids	214		

EXPLOSIVE OILS---KEROSENE AND ITS IMITATIONS---DANGEROUS COMPOUNDS.

For weeks past we have received a large number of communications complaining of the frauds practiced upon people by agents of what purported to be a non-explosive oil, cheaper than kerosene and giving a better light. While kerosene at first hands brings three, or three and a half dollars per barrel—or rather the crude petroleum at the wells—this manufactured compound is offered at two dollars per barrel or twenty cents per gallon. One of our correspondents says this so-called non-explosive oil is benzine of 71° gravity; another says, "it is composed of gasoline or naphtha mixed with common salt; this is the compound, but, I believe, in some cases rosemary oil is added to kill the smell. The salt is for the purpose of preventing the mixture from exploding. Do you think it will do it?" No, it will not. We have never made any test of this "non-explosive oil," but we are satisfied from the accounts published of its explosive properties and the accidents resulting therefrom, that it is a dangerous article to use for illuminating purposes. A slip cut from an exchange says: "Last week an agent of this oil, while trying to introduce it in the village of Warren, Pa., attempted to illustrate the impossibility of its exploding, by a practical test, but only succeeded in nearly blowing himself out of the window, and setting fire to the building in which he was. The oil is largely composed of benzine, and is an exceedingly dangerous article to use." A similar trial a few weeks ago in a hotel in Brooklyn, N. Y., resulted in severe injuries to one of the employés of the establishment. One claim made in favor of this "oil" (?) is that it is not greasy and will not soil any fabric. A singular recommendation for any oil. Such stuff is unfit to be peddled or used. Kerosene gives a better light than gas or any animal oil, and being cheap and handy is largely used; so much so as to have almost superseded whale oil and candles. It has become an article of general use, and, when properly manufactured, is deservedly popular. It is cheap enough, even when properly prepared, one would suppose, to prevent adulterations or imitations; yet we will venture to say no article so commonly used is furnished in so impure a state. Impure, or in its imitations, it is hardly less dangerous than gunpowder; yet, it can be made as innocuous as any animal or vegetable oil, so far as its explosiveness is concerned. Being a hydro-carbon it must always be more inflammable; but this is not necessarily an objection to it. The test of its quality we gave on page 180 current volume, a test so simple as to be readily made by any one. We reproduce it as given in the *Journal of Chemistry:*

Take a common quart bowl; fill it one-third full of boiling water; now add cold water a little at a time, until a thermometer placed in it indicates a temperature of 110 deg. Fah. A tablespoonful of the oil to be tested may be turned into the water, and stirred about with the thermometer. It will float on top, and it may be touched with a lighted match or bit of paper. If it ignites, or takes fire, the oil is dangerous; and the seller can be prosecuted under the United States law. It must not be used in the family. In this experiment, so simple that all can make it, an accurate thermometer should be used. The common thermometer in a japanned iron case, is usually sufficiently accurate. To test the the thermometer, bring water into the condition of active boiling; warm the thermometer gradually in the steam, and then plunge it into the water. If it indicates a fixed temperature of 212 deg, the instrument is a good one.

Dealers in kerosene, and especially those who buy at wholesale to sell at retail to families, should make this test, and not only reject that which does not come up to the mark, but enter complaint against the dealer who thus dares defy the law.

We are glad the press generally are awaking to the importance of this subject. We clip, from the *Journal of Applied Chemistry*, the following:

Certain parties in New York and elsewhere are attempting to impose upon the credulous public by offering recipes for the manufacture of illuminating compounds, the base of which is benzine or gasoline—the lighter products of the distillation of petroleum—mixed with certain chemicals. The averred object of the mixture is to render the fluid less volatile, or less liable to explode or ignite at a given temperature, but these pretended recipes are without exception, swindles, and do not give a compound posessing the qualities claimed.

Gasoline may be mixed with gum camphor, to give a clearer, lighter flame, and alum may be added to increase the specific gravity, but the liquid will not dissolve the salt in sufficient quantity to render it less dangerous than kerosene. Any one, therefore, who has paid the sum demanded for this secret, ($10 is the usual price), may thus have the satisfaction of knowing how little it is really worth, without subjecting himself to the risk of possibly fatal accidents by too implicit a reliance on these worthless recipes.

We think it is high time for something to be done by our legislators to insure more thoroughness in the business of refining coal oil of all kinds. The number of accidents daily reported from every section of the country by the use of improperly refined oil are truly appalling, and when to this large number we add the escapes, which are completely accidental, it will be seen that the danger to human life from this source alone is so great as to appeal more earnestly than ever before for decisive legislative action. Let it be a penal offense for anybody to sell any of the productions of coal oil for burning purposes unless they are known to be non-explosive, and let a law for the securing of that end be enacted at once.

PROPOSED REDUCTION OF PATENT FEES.

We observe with much pleasure that the Hon. W. Lawrence, of Ohio, has introduced a resolution in Congress instructing the Committee on Patents to inquire into the expediency of reducing the official fees. It appears that there is a large and constantly increasing surplus of funds, the accumulations of the moneys paid in by inventors, over and above the actual costs of carrying on the business of the Patent Office.

We hope the Committee will make thorough inquiry. If they do so, we have no doubt but they will be fully satisfied of the expediency of a reduction. We would call their attention, as a point of beginning, to the propriety of at once abolishing the fees for appeals. Prior to 1861, the patent fees were $30, without extra charges for appeals. In 1861, the fees were raised to $35, and $20 extra on appeal to the Commissioner. In 1866, another fee of $10 on appeal to the Examiners-in-chief was added.

The great majority of applicants for patents are poor, hard-working people, to whom the payment of these extra fees is a matter of the greatest difficulty.

We believe that there is no other department of the Government except the Patent Office where an extra fee is charged for a review by the chief to correct the errors or injustice of his subordinates. But at the Patent Office, no matter how obvious the error of the primary examiner, the applicant cannot open his mouth for redress without paying $10; nor can he get the Commissioner's attention to the matter without paying $20 more.

Mr. Lawrence, in the course of his remarks before Congress, presented the following statistics:

Table exhibiting the business of the Patent Office for twenty-nine years ending December 31, 1865.

Years.	Applications filed.	Caveats filed.	Patents issued.	Cash received.	Cash expended.
1837..	-	-	435	$29,269 08	$33,506 98
1838..	-	-	520	42,123 54	37,402 10
1839..	-	-	425	37,260 00	34,543 51
1840..	765	228	473	38,056 51	39,020 67
1841..	847	312	495	40,413 01	52,666 87
1842..	761	391	517	36,505 68	31,241 48
1843..	819	315	531	35,315 81	30,766 96
1844..	1,045	380	502	42,509 26	36,244 73
1845..	1,246	452	502	51,076 14	39,395 65
1846..	1,272	448	619	50,264 16	46,158 71
1847..	1,531	553	572	63,111 19	41,878 35
1848..	1,628	607	660	67,576 69	58,905 84
1849..	1,955	595	1,070	80,752 78	77,716 44
1850..	2,193	602	995	86,927 05	80,100 95
1851..	2,258	760	889	95,738 61	86,916 93
1852..	2,639	996	1,020	112,056 34	95,916 91
1853..	2,678	901	958	121,527 45	132,869 83
1854..	3,824	868	1,902	163,739 84	167,146 32
1855..	4,435	906	2,024	216,459 35	179,540 33
1856..	4,960	1,024	2,502	192,583 02	199,931 02
1857..	4,771	1,010	2,910	196,132 01	211,582 09
1858..	5,364	943	3,710	203,716 16	193,193 74
1859..	6,225	1,097	4,588	245,942 15	210,278 41
1860..	7,653	1,084	4,819	256,352 59	252,820 80
1861..	4,643	700	3,340	187,354 44	221,491 91
1862..	5,038	824	3,521	215,754 99	182,810 39
1863..	6,014	787	4,170	195,593 29	189,414 14
1864..	6,972	1,063	5,020	240,919 98	229,868 00
1865..	10,664	1,987	6,616	348,791 84	274,199 34

"It is here seen that the number of applications for patents received in 1865 exceeded, by nearly forty per cent, the number filed in any previous year, and the number of caveats filed exceeded those of any previous year by more than seventy-five per cent. The number of patents issued exceeded those issued in 1864, the highest previous year, by more than thirty per cent.

"The receipts into the patent fund exceed those of any former year by more than thirty-six per cent, while the expenditures were only increased a trifle over eight per cent, and a considerable surplus is left to the credit of the patent fund.

"I think it is manifest that the inventors of the country ought not to be taxed as heavily as they are now. In other words, the fees for procuring patents should be reduced."

THE BLOWPIPE---ITS USES.

A correspondent writing from Arkansas inquires about the construction and use of the blowpipe. We may perhaps furnish information to a number of our readers by a brief description of the implement and its application. The most simple and common form of the blowpipe is merely a tapering tube of metal from 8 to 12 inches long with a caliber varying from one quarter of an inch at the large end to a mere pin hole at the small end, which is usually curved or bent an inch or so from the end to nearly a right angle. Considerable practice is required to properly use this instrument, as a continuous blast should be kept up and yet the lungs not be exhausted of air. It is effected by breathing only through the nostrils and using the cheeks as bellows for propelling the air. No verbal directions can instruct the learner; the art is acquired only by practice. The blowpipe is an instrument of great value to jewelers for soldering work, and also for glass blowers and enamelers. But its importance to the mineralogical and analytical chemist cannot be overated, as it serves the purpose of a furnace for the cupellation and analysis of metals, ores, and other minerals. The blast is often given—where the work is continuous—by a bellows, or other blowing engine. In use, as by jewelers, the article to be fused or heated is laid on a piece of charcoal, and the point of the blowpipe, held by one hand, is placed in the flame of a lamp or a gas jet, while the other hand holds the charcoal with the article or piece of jewelry upon it. A cone of flame, yellow on its exterior surface but brightly blue within, is the result, the outer yellow flame possessing oxidizing properties, while the inner flame gives a most intense heat. It can be readily used for refining small specimens of the precious metals by cupellation. The cupel is, as its name denotes, a small cup or crucible, composed of burned powdered bones mixed into a paste with glue water and pressed into a mold. Its substance, in the fusion of gold or silver alloyed with lead or some other base metal, absorbs the baser metal and leaves the precious metal in the form of a button at the bottom. In repairing jewelry a piece of charcoal is the best receptacle for the article to be acted upon, not only for its lightness and facility of handling, but because it facilitates the process of fusion by its chemical action in extracting the oxygen of the metal.

The blowpipe is useful also for ascertaining the qualities of otherwise undetermined substances. They are melted with different fluxes as borax, carbonate of soda, etc upon a piece of fine platinum wire hooked at the end. By the reaction of the ingredients of the substance with the flux, the nature of the ingredients are determined by their colors.

Modifications of the blowpipe and automatic or self-acting blowpipes have been made, but the common hand blowpipe is still the favorite for light work and for its ease of manipulation. The oxyhydrogen blowpipe, the invention of Dr. Robert Hare of Philadelphia, is too well known in its construction and uses to require a description in this article.

THE DISTRIBUTION OF SODIUM IN NATURE AND THE VALUE OF ITS COMPOUNDS AS MANURE.

The belief hitherto prevailing among scientific men that potassium and sodium were generally associated with each other in the vegetable kingdom, has received a severe shock by a series of experiments lately undertaken by Eugene Peligot, a distinguished French *savant*, and on account of the importance of the results we purpose presenting a brief description of them.

The absence of sodium in the horse chestnut, the pea and colza had been demonstrated some time ago; Peligot analyzed the ashes of wheat, oats, potatoes, oak, of tobacco, mulberry, and peony leaves, of palma christi, kidney beans, marigold, pellitory, parsnips, etc.; and although he experimented with large quantities of material, he could discover no trace of sodium salts. Only a few plants of the class *chenopodiaceæ* formed an exception. Peligot explains these facts by assuming an indifference and even an antipathy on the part of plants to chloride of sodium on account of the stability of this compound and of the difficulty with which it enters into new combinations. Even the plants that grow on soil impregnated with salt, the marine plants and fungi, for example, seem to share this repugnance. It is certainly remarkable that kelp which is manufactured from plants living in a medium in which the soda salts predominate largely over those of potash, contain more of the latter than of the former. Peligot advises, therefore, not to employ rock salt in agriculture to a greater degree than is necessary to insure a certain humidity of the soil and to facilitate the solution of other fertilizers. He condemns the use of all manures which concontain a large amount of soda salts and approves the treatment of human excrements with water and reducing them to powder before their employment on the field. It is unnecessary to mention, that all that has been said refers only to the chloride and sulphate, and not to the phosphate and nitrate; for in the latter the acids and not the base form the useful principle.

Doubtless the reader will ask, how it is possible that the large number of chemists who mention soda in the analyses of vegetable ashes can all be in the wrong? Peligot replies with a show of truth that they have generally contented themselves with evidence of the presence of another base beside potash, and that they assumed this to be soda without further inquiry into its chemical character. According to his researches, it is generally a small amount of magnesia, the salts of which it is difficult to separate completely from those of the alkalies. He is convinced that magnesium is as necessary to the growth and development of plants as phosphorus and nitrogen, and that the presence of this element alone accounts for the utility of clays and marls as fertilizers on soil already calcareous.

The sugar beet is an interesting case in point. It is capable of assimilating very variable quantities of potash and soda. In the beginning of its cultivation the use of rock salt seems to be advantageous on account of the magnesium which it contains; after a lapse of time, however, the root deteriorates and the yield of sugar diminishes in the same proportion as the amount of sodium in the ashes increases.

Many of the facts here presented are novel, and, if true, of great practical value, and we may, therefore, expect in the

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mmediate future full and comprehensive investigations of points which can only result in valuable additions to our knowledge and in useful hints to the men of practical science.

ADHESION OF LEATHER BELTS TO CAST IRON PULLEYS.

In the January and February numbers of the *Journal of the Franklin Institute* are two articles on the above subject which present some facts of value to mechanics and others who employ belts in the transmission of power. The facts given are the result of numerous experiments made by Mr. H. R. Towne, at the suggestion of Mr. Robert Briggs, and although begun and conducted without a knowledge of those made by Gen. Morin and M M. Poncelet and Prony, the results of which appear as a translation in Bennett's *Morin's Mechanics*, it adds to their value to know that the results of these independently conducted experiments are virtually the same. The fact that not only the butts in which the lacing holes are punched, but even the splices are the weakest portions of the belt will surprise many who regard the latter, when properly made, as the strongest parts. From the manner, however, in which the experiments were conducted it would seem useless to attempt a dissent from the results as presented.

The report says: The experiments were made with leather belts of three and six inches width and of the usual thickness —about $\frac{3}{16}$ths of an inch. The pulleys used were respectively, of 12, $23\frac{5}{8}$, and 41 inches diameter, and were in each case fast upon their shafts. They were the ordinary cast iron pulleys, turned on the face, and, having already been in use for some years, were fair representatives of the pulleys usually found in practice.

Experiments were made first with a perfectly new belt, then with one partially used and in the best working condition, and, finally, with an old one, which had been so long in use as to have deteriorated considerably, although not yet entirely worn out. The adhesion of the belts to the pulleys was not in any way influenced by the use of unguents or by wetting them—the new ones when used were just in the condition in which they were purchased—the others in the usual working condition of belts as found in machine shops and factories—that is, they had been well greased and were soft and pliable.

The manner in which the experiments were made was as follows:—The belt being suspended over the pulley, in the middle of its length, weights were attached to *one* side of the belt, and increased until the latter slipped freely over the pulley; the final, or *slipping* weight, was then recorded. Next, 5 lbs. were suspended on *each* side of the belt, and the additional weight required upon *one* side to produce slipping ascertained as before, and recorded. This operation was repeated with 10, 20, 30, 40, and 50 lbs., successively, suspended upon both sides of the belt. In the tables these weights, *plus* half the total weight of the belt, are given as the "equalizing weights" (T_2 in the formulæ), and the *additional* weight required upon one side to produce slipping, is given under the head of "unbalanced weights;" this latter, *plus* the equalizing weight, gives the total tension on the loaded side of the belt (T_1 in the formulæ).

The bolt, in slipping over the pulley, moved at the rate of about 200 feet per minute, and with a constant, rather than increasing, velocity; or, in other words, the final weight was such as to cause the belt to slip smoothly over the pulley, but not sufficient to entirely overcome the friction tending to keep the belt in a state of rest. In this case (*i. e.* with an excessive weight) the velocity of the belt would have approximated to that of a falling body, while in the experiments its velocity was much slower, and was nearly constant, the friction acting precisely as a brake. By being careful that the final weight was such as to produce about the same velocity of the slipping belt in all of the experiments, reliable results were obtained.

It became necessary to make use of a weight such as would produce the positive motion of the belt described above, as it was found impossible to obtain any uniformity in the results when the attempt was made to ascertain the minimum weight which would cause the belt to slip. With much smaller weights *some* slipping took place, but it was almost inappreciable, and could only be noticed after the weight had hung for some minutes, and was due very probably to the imperceptible jarring of the building. After essaying for some time to conduct the experiments in this way, and obtaining only conflicting and unsatisfactory results, the attempt was abandoned, and the experiments made as first described.

In this way, as may be seen, results were obtained which compare together very favorably, and which contain only such discrepancies as will always be manifest in experiments of the kind. It is only by making a great number of trials and averaging their results, that reliable data can be obtained.

The value of the co-efficient of friction which we deduce from our experiments, is the mean of no less than one hundred and sixty-eight distinct trials.

It will be noticed, however, that the co-efficient employed in the formulæ is but *six-tenths* of the full value of that deduced from the experiments, the latter being 0·5853 and the former 0·4229. This reduction was made, after careful consideration, to compensate for the excess of weight employed in the experiments over that which would just produce slipping of the belt, and may be regarded as safe and reliable in practice.

A note is made, over the record of each trial, as to the condition of the weather at the time of making it—whether dry, damp, or wet,—and it will be noticed that the adhesion of the belts to the pulleys was much affected by the amount of moisture in the atmosphere. It is to be regretted that this contingency was not provided for, and a careful record of the condition of the atmosphere kept by means of an hygrometer. The experiments indicate clearly, however, that the adhesion of the old and the partially used belts was much increased in damp weather, and that they were then in their maximum state of efficiency. With the new belts the indications are not so positive; but their efficiency seems to have been greatest when the atmosphere was in a dry condition.

Experiments were also made upon the tensile strength of belts, with the following results:—The weakest parts of an ordinary belt are the ends through which the lacing holes are punched, and the belt is usually weaker here than the lacing itself. The next weakest points are the *splices* of the several pieces of leather which compose the belt, and which are here perforated by the holes for the copper rivets. The strengths of the new and the partially used belts were found to be almost identical. The average of the trials is as follows:—

Three-inch belts broke through the lace holes with.. 629 lbs.
" " " " rivet " ..1146 lbs.
" " " " solid part " ..2025 lbs.

These give as the strength *per inch of width*:

When the rupture is through the lace holes..... 210 lbs.
" " " " rivet " ..... 382 lbs.
" " " " solid part..... 675 lbs.

The thickness being $\frac{7}{32}$ inch (=·219), we have as the tensile strengh of the leather 3086 lbs. per square inch.

From the above we see, that 200 lbs. per inch of width this is the ultimate resistance to tearing that we can expect from ordinary belts.

The experiments herein described are strikingly corroborative of those already on record, and this gives increased assurance of their reliability, and, although there is nothing novel either in them or in their results, it is hoped that they will prove of interest, and that an examination of them will lead to confidence in the formulæ which are based upon them.

PLATINUM AND PLATINIZING METALS.

The name of this, the heaviest and most infusible of metals, is derived originally from a Spanish word signifying *little silver*, although rarely does it resemble in color and luster that noble metal, its appearance usually being more like that of pewter. It is for the most part met with in alluvial districts associated with the débris of the earliest volcanic rocks. Our chief supplies are derived from the mines of Mexico and Brazil and of the Ural mountains. Platinum when pure is about as hard as copper; in ductility it rivals iron, and in tenacity it is inferior only to iron, cobalt, nickel, and perhaps copper. It resists the highest heat of the forge; is not attacked either by sulphur or mercury; it does not dissolve in any simple acid, and in aqua regia but very slowly. On account of these properties platinum is peculiarly adapted as a material for making chemical vessels. As it cannot be worked like ordinary metals, the Russians, who made coins of it, adopted the plan invented by the English chemist Wollaston, of submitting the "spongy platinum"—formed by precipitating a solution of platinum in aqua regia, by chloride of ammonium—to powerful pressure and repeated blows, also to the influence of a very high temperature, the fine particles of the metal after this process being made to cohere into a uniform solid mass. It is thus that chemists' crucibles and sulphuric acid stills are made. In the concentration of oil of vitriol some of the stills used weigh upward of 1,000 ounces. It has been found, however, that these vessels made after Wollaston's method after a time become so porous as to allow the acid to gradually transude, to prevent which it is necessary to gild their inner surfaces. The metal platinum is also used for the nipples of rifles and other fire-arms. "Spongy platinum," before referred to, whenever a jet of hydrogen gas is projected upon it, has the power of condensing the oxygen of the air in the pores of the metal, and the rapid union with the hydrogen causes the ignition of the latter, as is shown in the well known Dobereiner's hydrogen gas lamp.

These facts may be well know, but they serve to introduce a notice of something newer and less familiar, namely, a simple plan for covering other metals with a delicate film of platinum, so as to endow them with one of the leading virtues of this metal—its power to resist corrosion. The process is communicated by Prof. A. H. Church to the London *Chemist and Druggist*.

If a few grains of scraps of platinum are dissolved in aqua regia the resulting liquid contains a compound of the metal platinum with the metallic element chlorine. This compound is commonly called bichloride of platinum. Now dissolve 60 grains of this salt and 60 grains of pure honey; add to the above solution three quarters of an ounce of alcohol and one quarter ounce of ether. The objects to be platinized, which may be of iron, steel, copper, bronze or brass, are thoroughly cleansed by washing first in soda, then in water. When dried, they require heating to redness over a lamp, the article being carefully suspended so as not to touch the flame, and before being cooled, it is to be suddenly and entirely plunged beneath the surface of the platinizing liquid. One immersion for a single minute is usually sufficient, but the process may be repeated if necessary, care being taken to carefully wash and dry the pieces operated upon before reheating them.

The composition of the liquid may vary considerably in the proportion of honey and the bichloride, and still with good results. It may be used several times, but gradually loses all its platinum, the latter being supplanted by the iron or copper dissolved off the immersed objects. Watch chains, steels, sword handles, keys, and similar useful or ornamental objects are greatly improved in appearance by the platinizing process, and moreover are preserved from all chance of rusting. The color of the platinum film is of neutral grayish black, and often irridescent. Many artistic applications of the process will readily suggest themselves. Objects partially gilt or silvered will be only changed in those parts which show the original metal; in this way beautiful designs in gold on platinum or silver on platinum may be formed, the contrast in colors being exceedingly beautiful, while neither the gold nor silver are in the least degree affected.

Separating Fibers from Wood and other Substances.

Moore R. Fletcher, of Cambridgeport, Mass, has lately obtained a patent, as above:

"For making pulp for brown paper, or fiber for spinning, felting, matting, or other fibrous or textile fabrics not requiring bleaching, I take, of good unslaked lime, ten pounds, and slake it thoroughly, making a milk of lime, which is then mixed in about eight thousand gallons of water, or as much as will cover one tun of the vegetable matter contained in a wooden tank. Heat is then applied to the tank, and its contents, by steam, passed through pipes, or by means of a fire, in the ordinary manner, until the temperature of the said solution reaches to about 135° Fahrenheit. The heat is then checked, and the temperature of the solution is kept at the above degree of heat for from ten minutes to one hour, or more, according to the quality and condition of the material under treatment. The heat of the solution is then raised to 195° Fahrenheit, or even to the boiling point, and kept at that temperature until the fibrous matter in the tank is sufficiently treated, which may readily be determined by any skillful person upon testing a small sample in the manner well known to expert paper makers. The degree of temperature above named is not indispensable, for, where time is not important, excellent results may be obtained from a temperature of 65° to 70° Fahrenheit; but the time required increases as the temperature is diminished. The solution is then drawn off, and the fibrous vegetable matter in the tank is washed either with cold or warm water, but preferably in water at a temperature of about 125° Fahrenheit, or the fibrous vegetable matter may be removed from the tank, and rubbed, pounded, or crushed between rollers, or otherwise manipulated, to separate the fiber, and then washed in a pulping engine, or by other suitable means. Such of the fibrous vegetable matter as is intended for pulp for making brown paper may be put into a pulping engine and beaten carefully to preserve the length of the fiber, and subsequently made into paper in the ordinary manner. If the fibrous vegetable matter is to be made into white pulp, for making paper, or other fibrous or textile fabrics, soda-ash, or some of the salts of soda, may be used instead of lime in the same proportions, and subjected to the same treatment as above described.

"I have found that a bleach may be cheaply obtained by the use of two parts of soda-ash and one part of chloride of lime, some of the fibrous vegetable substances, such as wood, straw, and some of the grasses, being required to stand in the bleaching solution from four to sixteen hours; and to obtain a pure white, and retain the strength of fiber, it can be done by several solutions with alternate drainings.

"As different kinds of fibrous vegetable matter require a stronger or weaker solution, the above-named proportions may be varied to suit the circumstances of the case, and a longer or shorter period of time may also be required for softening and separating the albuminous, resinous, or nitrogenous matter."

Area of the States and Territories.

The following table, compiled at the Land Office, shows the order of the States and Territories, from the largest to the smallest:

States.	Square Miles.	*States.*	Square Miles.
Texas	274,356	New York	47,000
California	188,981	Pennsylvania	46,000
Nevada	112,090	Tennessee	45,600
Colorado	104 500	Louisiana	41,346
Oregon	95,274	Ohio	39,964
Minnesota	83,531	Virginia	38,352
Kansas	81,318	Kentucky	37,680
Nebraska	75,995	Maine	35,000
Missouri	65,350	South Carolina	34,000
Florida	59,268	Indiana	33,809
Georgia	58,000	West Virginia	23,000
Michigan	56,451	Maryland	11,124
Illinois	55,410	Vermont	10,212
Iowa	55,045	New Hampshire	9,280
Wisconsin	53,924	New Jersey	8,320
Arkansas	52,198	Massachusetts	7,800
Alabama	50,722	Connecticut	4,750
North Carolina	50,704	Delaware	2,120
Mississippi	47,156	Rhode Island	1,306

TERRITORIES.

Aliaska	577,390	Idaho	90,932
Utah	240,597	Utah	88,056
Montana	143,776	Washington	69,994
New Mexico	121,201	Indian Territory	68,991
Arizona	113,916	District of Columbia	10

The Havre Marine Exhibition will open on June 1st and be continued until Nov. 1st. The buildings are now so far advanced that preparations are being made for receiving and arranging the articles to be exhibited, which are divided into five groups and forty-two classes. Under these divisions will be ranged all kinds of implements and apparatus used in navigation and fishing, as well as the various arts and occupations relating to the sea in general. One of the principal curiosities of the exhibition will be a grand aquarium, one half larger than the one at the Paris Exposition, and presenting an imitation of Fingal's Cave, in Scotland. A pamphlet we have received relating to this exhibition, contains an appeal to American manufacturers, constructors, and inventors of every description of articles relating in any way to the sea, soliciting their coöperation. The New York agent is M. Victor Precht, No. 40 Broadway, who will furnish any additional information desired.

The heat which the earth receives from the sun does not penetrate more than from 50 to 100 feet. At Paris this stratum of invariable temperature is found at a depth of 86 feet

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Our Apprentice System.

We have commented several times on the relations between master and apprentice in this country, and alluded to the rules of Trades' Unions on this subject. The following from the Brooklyn (N. Y.,) *Eagle* is so pertinent to the matter that we offer no apology for its reproduction :—

"A rule of the Trades' Unions has been brought into court in Morrisania, and the decision of the case will interest members of these organizations. A man named Dawson sued three members of the Bricklayers and Plasterers' Union for damages for having conspired to prevent his son from learning the bricklayer's trade, by refusing to work for their mutual employer until the boy was discharged. Some of the Trades' Unions have rules prescribing the number of apprentices that shall be taken, with other conditions, and they enforce this rule by refusing to work for bosses unless they comply with it. The suit was tried before a local judge and jury and a verdict for the plaintiff rendered, with a judgment for nominal damages—five dollars. The case is, however, to be carried to the Supreme Court to test the legality of trade combinations to effect the interests of third parties.

"While the rules of the Trades' Unions may be objectionable, being designed only to protect the journeymen from the competition of cheap boys' labor, the mechanic interest demands a revision of the American apprentice system, and stricter laws for its government. The old-fashioned custom of binding boys to their master for a term of years to learn a trade, and which used to insure a supply of competent workmen, has become obsolete. Boys are employed without formal agreements or legal obligations; they may work for one man till they pick up a little practice at the trade, when they go off somewhere else to turn this experience to account in higher wages. Employers have no interest in learning the boys anything, and the most they pick up is a superficial knowledge of their business, and they remain poor workmen all their lives. It is beginning to be a matter of general complaint in many callings that there are so few skilled mechanics,—men who thoroughly understand their business and can be entrusted with the better class of work. And it is humiliating to be told that we are dependent on emigration from Europe for most of the skilled mechanical labor we have, rigid apprentice laws being still in force in the old country, bearing their fruit in a crop of good mechanics. Instead of trying to remedy the evil by society rules which can not reach the root of it, and the enforcement of which can only be done by questionable means, the workingmen should apply to the Legislature to pass some more definite law regulating apprenticeship, holding minors bound by their agreements of service. It may be that the old apprentice law, which held a boy to service until he came of age, gave the master, to whom he was indentured, the right to inflict corporeal punishment, and the power to have the apprentice summarily arrested and sent to jail for disobedience is too harsh for this age; but we have gone a little too far in the opposite direction in removing all restraint from youth, destroying that discipline that is necessary to the future welfare of the rising generation."

Swinging the Circle with a Grape Vine.

The following absurd "improvement" in the culture of grape vines bears a recent seal of the Patent Office, the invention of George Perry, Georgetown, Conn.

In the ordinary modes of cultivating grape vines, it is customary to prune the vines each year, cutting off nearly all of the old wood, and thus confining each year's foliage to the new wood, which shoots from the parent stock, near to the root, during that year. The natural and inevitable result of this process is a destruction of the balance, intended and instituted by nature, existing between the roots and wood and foliage growth of the plant. The roots and foliage have each reciprocal functions to perform, both necessary to the perfect health of the plant, and if either be interfered with, it must result in the disarrangement of the other. The fruit of the vine adds nothing to its vigor, but is actually so much extracted therefrom, and it is consequently found that, in cases where the vine has been sacrificed to force the fruit in greater than natural quantity, the roots become relatively too large to be properly reacted upon by the existing quantity of foliage, and the vine becomes diseased, and ceases to bear, or the fruit fails to mature properly, and is subject to mildew, rot, etc. The above is a popular error. By my system of cultivation these evils are obviated by continually preserving new and fresh roots to the plant, constantly in perfect balance with the fruit and foliage, and aged and unhealthy roots are lopped off.

Beginning with a post, marked 1, for convenience, we will describe our mode of operation :

A vine is first set at each post, either in the spring or fall, as deemed best, and is trained to its post, and allowed to grow one year or more, one year being generally sufficient. Then a shallow trench is dug between the posts, around a circle, in which each vine is laid down from its post to the next, where it is trained for another season. The vine at post No. 1 is laid down and covered with soil to the post No. 2, the vine at post No. 2 being treated in the same manner, and trained to No. 3, and so on around the circle, when each vine will have been trained to a post three feet from its original root, They are allowed to grow in these positions another year or more, when the same operation is gone through with again, and then each vine will be found six feet away from its original root, and the portions covered with earth will be found supplied with new roots throughout the whole space of six feet, thereby greatly increasing the strength and vigor of the plant. After growing another year or more, the vines may be again laid down and trained to the next adjoining post, where the vine originally planted at post No. 1 will be found at post No 4, and each one around the circle will be found growing at a distance of nine feet from the point at first set out. By this time, the portion laid down (at least nine feet) will have sufficient new roots to support the growing vines, and the original root may be severed at the post where it was set. Thus the growing vine will become free from the old original root, which may have become diseased or partially dead, and have, at all times, comparatively new and fresh roots, as three feet would be formed each season after "layering," and that part of the root which should be four years old or more removed, so that the vines and roots will, in one sense, be always young, more vigorous, and capable of producing fruit, and, at the same time, be better able to resist the attacks of insects, mildew, and rot, which are found to attack old vines more than young ones.

[We venture to say that the vine, properly cultivated in one position for four years, will give far better results than if trained and layered around a circle, as the above patentee suggests.—EDS.

Artificial Wine.

John F. Siebenmann, Milwaukee, Wis., has obtained a patent for the following queer mixture: Water, fifty gallons; raise the temperature of the room to 86° or 90° Fah., after which add the following ingredients:

	For ordinary quality.	For best quality.
White sugar	95 pounds.	150 pounds.
Pure tartaric acid	3 "	2¼ "
Tamarind	6 "	6 "
Raisins	6 "	12 "

The raisins should be severed from the stems, and cut or crushed. Boiling water should then be added until the temperature of the mass is raised from 81° to 90°. The mass should then be well mixed to dissolve the sugar and acid. When dissolved, add six pints of good beer yeast, for the ordinary quality, or eight and a quarter for the best quality, and mix thoroughly. If wine yeast can be procured, as it can be after it is once formed, it may be used instead, but double in quantity.

Care should be taken that the temperature does not rise above 90°, nor fall below 81°—86° being suited for the purpose. In about twelve hours the mass will be in fermentation, and at first it should be stirred up about once in twelve hours, but afterward once in twenty-four hours, until fermentation ceases, which will occur in from ten to fourteen days. When the fermentation is over, the wine is placed in casks and put into the cellar, where it still ferments for three or four weeks, after which it is ready to be drawn from the casks and purified, In order to give to the wine, especially the best quality, its "bouquet," the following ingredients are added to the mass in the tub, before the yeast is added: Fresh-dried elder flowers, 1 oz.; crushed nutmegs, ½ oz.; cut mace, ¼ oz.; Florentine iris root, ½ oz.; and one pod of vanilla, also cut. The color is imparted by the application of the sugar color, a process well known to those skilled in the art, after the second fermentation is completed and the wine is drawn off. In order to make red wine, fruits or berries are used which give a red color, such as cherries, whortleberries, elderberries. blackberries, etc. These are crushed and added to the mass when fermentation commences.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING MARCH 17, 1868.

Reported Officially for the Scientific American.

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75,507.—CARD HOLDER.—W. Inck Adams, New York city.

I claim the removable spring back plate, D, when provided upon its sides, near one end, with the lugs, E, fitting into the inclined grooves, F, upon the under side of the frame, A, the free end of said plate pressing against the under side of the shoulder, a, as herein described, for the purpose specified.

75,508.—FEED CUTTER.—Truman P. Allen, Gowanda, N. Y.

I claim, 1st, Arranging the two knives, C and D, substantially as herein shown and described, so as to obtain a drawing stroke with each knife.

2d, Applying the power directly to the knives, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the knives, C and D, pivoted connecting bars, E, and branched operating lever, F, with each other, substantially as herein shown and described and for the purpose set forth.

75,509.—EXTRACTING SACCHARINE MATTER FROM MALT.—Wm. Anheuser, St. Louis, Mo.

I claim, 1st, The process of extracting the saccharine malt liquid from the malt by pressing.

2d, The process of pressing the malt refuse left after infusion, for the purpose of obtaining an additional quantity of saccharine juice.

75,510.—LANTERN.—Ellis S. Archer (assignor to Archer, Paircoast & Co.), New York city.

I claim, 1st, The combination of the top piece or plate, E, constructed and formed as described, with the frame and side plates of a lantern, substantially as and for the purpose set forth.

2d, The passing of the spring through the side of the lamp, and soldering it upon the inside of said side, substantially as described.

3d, The forming the catch of the spring by punching and striking out a portion of the spring itself, substantially as and for the purpose set forth.

4th, The combination of the spring, O, constructed and astached as described, with the lamp and frame of a lantern, substantially as described and for the purpose set forth.

75,511.—SMOKE STACK FOR LOCOMOTIVE ENGINES.—Jearum Aikins, Washington, D. C.

I claim, 1st, Providing a series of conical or tapering tubes or passages, through which the products of combustion are made to pass on their way from the furnaces of steam generators, arranged substantially as shown and described.

2d, The combination of the divided exhaust nozzle and the tapering tubes or passages substantially as shown and described.

3d, The arrangement of blast tubes, M, with reference to the tubes or passages, J J J and F F, substantially as shown and described.

75,512.—STUMP EXTRACTOR.—S. S. Avis, Pennsgrove, N. J.

I claim, 1st, the trestle horse, A c c c c e, and lever, B, substantially as shown and described, in combination with the chain, i, as and for the purpose set forth.

2d, The plates, b and d, substantially as shown and described, in combination with the lever, B, and trestle horse, as and for the purposes set forth.

3d, The pedestal planks, e, in combination with the trestle horse and lever B, substantially as and for the purpose shown and described.

75,513.—CAR TRUCK.—Joseph Baysore, Freeport, Ill.

I claim the arrangement and method of connection of the axles, A, of the truck to the car bed, K, through the medium of the straps, F, bars D, rollers L, and circle plate, J, arranged substantially in the manner as and for the purpose set forth.

Also the springs, C E, arranged and applied to the truck substantially in the manner as and for the purpose specified.

75,514.—HORSE RAKE.—Henry L. Beach, Montrose, Pa., assignor to Beach Wheel Horse Rake Manufacturing Company.

I claim, 1st, A shoe or foot constructed and operating substantially as described, for the purpose specified.

2d, Attaching the shoe or foot substantially as herein described, for the purpose specified.

75,515.—CHEESE VAT.—H. H. Bent, Antwerp, N. Y., assignor to himself and E. Sims.

I claim the box, L, provided with partition, R, and discharge pipes, S, in combination with the standard, P, vibrating bars, K H H, and the adjustable paddle or agitator, I, the several parts being constructed and operated substantially as and for the purpose herein fully set forth.

75,516.—GAS AND OTHER HEATERS.—John Q. Birkey, Philadelphia, Pa.

I claim, 1st, The receiver, D, for collecting the noxious vapors, deleterious gases, and other impurities arising the combustion of fuel, in combination with a pipe, tube, or outlet, for conducting the said gases and impurities to the vessel where the same are neutralized, substantially as set forth.

2d, Neutralizing or destroying the impurities arising from combustion in water or chemical agent, substantially as described.

75,517.—FARM GATE.—William Brown, Addison, Mich.

I claim, 1st, The levers, J, when constructed and operating for the purposes hereinbefore described.

2d, The combination of the above levers with the gate, A, the upright bars B C, the wheels, D, the horizontal bar, E, the double posts, F G H, the horizontal bar, described as being hung upon rods near the top of the posts, G H, the cranks, I, the rings or blocks, M N, the cords or chains, L, the posts and arms, O, the guides, P, and the latch, R, when constructed, arranged, and operating substantially as and for the purposes herein set forth.

75,518.—CAR BRAKE.—Wm. H. Burke, Brighton, Mass., assignor to himself and James E. Wilson, Springfield, Me.

I claim the combination and arrangement of the three shafts, F F I, their screws, H H, worm gears, G G, cams, E, and the bevel gears, L M, and vertical hand wheel shaft, N, arranged at either or each end of the carriage, and with respect to the brakes, D, substantially in manner as specified.

75,519.—BED BOTTOM.—Ezra Caswell, Lyons, N. Y.

I claim the bed bottom constructed as described, and consisting of the slats, C, frame, D, having slotted cross bar, f, plate, a, having hooks, B, link, F, elastic strap, E, wedge, g, and screw, e, all arranged and operating as described and for the purpose specified.

75,520.—GRAIN SEPARATOR.—W. T. Chaffee (assignor to himself and Samuel M. Drinker), Richmond, Va.

I claim, 1st, The combination of the perforated, sliding, triangular bars, B and C, with each other and with the frame, A, substantially as herein shown and described and for the purpose set forth.

2d, Connecting one of the triangular bars, as C, to the cross bars, a', of the frame, A, by the dovetailed bars, E and G, and hand screws, F, or by equivalent means, so that it may be moved back and forth or adjusted laterally, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the crank shaft, A, and pitmen, I, with the sliding triangular bars, B and C, with the frame, A, substantially as herein shown and described and for the purpose set forth.

75,521.—CAR WHEEL.—S. B. Chapman, New York city.

I claim a wheel for railway cars composed of the metal plates, A, E, wooden sections, C, and the elastic ring, Ax, all being secured together by bolts, and used with or without rings, D D, substantially as herein shown and described.

75,522.—SHUTTLE FOR LOOMS.—Daniel G. Chase, Boston, Mass.

I claim the combination of the open slotted spindle head, c, coiled spring, b, and plate spring, e, with the shuttle, A, and stop pin, g, the whole being constructed and arranged for operation as herein shown and described.

75,523.—STEAM ENGINE GOVERNOR.—Daniel L. F. Chase, Boston, Mass.

I claim, 1st, The combination of the valve stem and sectoral rack or lever with the vibratory arm, k, pinion, h, and shaft, i, receiving motion directly from the driving shaft, o, substantially as and for the purposes shown and set forth.

2d, The combination of the valve stem, the sectoral rack or lever, and its actuating pinion and vibratory shaft of the gear, m n, shaft, o, and lever, v, link, z, and sleeve, s, substantially as and for the purposes herein shown and specified.

3d, The construction of the sectoral lever, d, as composed of the eccentric slot, e, with its enlargements a1 a2, and its toothed racks, f and g, essentially as before set forth and explained.

4th, The combination with the arch, l, of the vibrating arm or bracket, k the shaft, i, the gears, m and n, the bracket being pivoted to the arch as before explained.

75,524.—BAKE PAN.—Justus Chase, Jr., Watertown, N. Y.

I claim the bread pan consisting of the dome, D, and base A B, with suitable connecting devices, constructed as herein described and for the purposes set forth

75,525.—COVERING FOR SHAFT COUPLING.—Sidney E. Chase, Mendon, Mich.

I claim the construction of a coupling cover as hereinbefore described, and operating substantially as and for the purposes set forth.

75,526.—FERRY BRIDGE GUARD.—James A. Clarke, New York city.

I claim the self-acting draw, k, actuated by the fender, c, substantially as and for the purposes set forth.

75,527.—BEDSTEAD.—John C. Clime (assignor to himself and J. Moore Hendricks), Philadelphia, Pa.

I claim, 1st, The arrangement of the notched slats, A, coil springs, B, middle supporting bar, C, and adjustable head bars, D, when these several parts are constructed substantially as shown and described, for the purpose specified.

2d, The perforated hollow tube, F, in combination with the coil springs, B substantially as set forth.

75,528.—HAY RAKER AND LOADER.—John S. Coffman and Manassah Graybill, Greenville, Ind.

We claim, 1st, The loose teeth, F, and bar, G, in combination with the pivoted arm, H, rods, J J, jointed connecting bar, k, and lever, P', all arranged to operate as herein shown and described.

2d, The receiving platform, E, when adjusted upon the frame, D, by means of the cord, o, ratchet and pawl, and the crank, p, upon the rod, n, as herein described, for the purpose specified.

3d, The arrangement of the frame, D, burden wheel, A, caster wheels, B, adjustable apron, E, loose teeth, F, and their operating mechanism, the endless apron, C, and shaft, G, all operating as described, for the purpose specified.

75,529.—LAMP LIGHTING DEVICE.—Noah L. Cole, Norwich, Conn. Antedated Feb. 28, 1868.

I claim, 1st, The within described combination of devices for ejecting matches, consisting essentially of the revolving chambered cylinder, g, piston, e, catch spring, f draw pin, d, spring, b, cylinders, a and l, and handle, c, or their equivalents, arranged and operating substantially as described.

2d, The combination with the elements of the preceding clause, the igniting and holding spring, k, applied and operating substantially as described.

3d, The wrench, i, applied to a match ejecting instrument in the manner and for the purpose described.

75,530.—LOOM.—George Crompton, Worcester, Mass.

I claim in combination with angular lifter and depresser levers, working upon fulcra in the plane of the cloth-making line, horizontal rigid evener bars fixed to the slide rods and operating to even the jacks, substantially as described.

Also, in combination, horizontal rigid eveners, secured to slide rods, angular lifter and depresser levers, and the slotted jacks, substantially as described.

Also, the slotted angular lifter and depresser levers, working on stationary fulcra, combined substantially as described with the slide rods.

Also, angular lifter and depresser levers, vibrating on stationary but adjustable fulcra, and fixed by sliding or yielding connections to the actuating rods, substantially as described.

Also, in combination with the movable shuttle boxes and mechanism for supporting and for changing them, the stirrup, s, arranged to operate substantially as described.

Also, in combination with the tappet lever and stirrup, constructed as described, the link, b, connecting the lever and stirrup, and arranged relatively thereto, substantially as described.

75,531.—VELOCIPEDE FOR LAND AND WATER.—William G. Crossley, Cambridge, England.

I claim, 1st, The velocipede in which the body is made so as to serve as a boar or car, as the same is used upon land or water, and constructed substantially as herein described.

2d, The combination of treadles, B, and levers, a b c, etc., for operating the shaft, arranged substantially in the manner shown.

75,532.—HORSE RAKE.—B. W. Davis, Fort Madison, Iowa.

I claim a band or stirrup, A, for connecting the shaft, B, to the handle, C, of any rotating horse rake, D, furnished with the slot or holes, a, substantially as shown and described and for the purposes set forth.

75,533.—SPIRIT LEVEL.—L. L. Davis, Springfield, Mass.

I claim, in combination with the screws, d d', having the conical points, e e', the studs, i i', placed in the ring, D, which has a reciprocating rotary motion, all constructed and arranged substantially as herein described and set forth.

75,534.—ADJUSTABLE SPIRIT LEVEL.—L. L. Davis, Springfield, Mass.

I claim, 1st, The adjustable bubble glass case, h, having the elastic adjusting ears, i i, and projection, o, when constructed and arranged substantially as described and for the purposes herein set forth.

2d, In an adjustable spirit level, the case, h, having the elastic adjusting ears, i i, and the projection, o, and operated or adjusted by means of the screws, f f, in combination with the plate, a, and pin, n, substantially as herein described and set forth.

75,535.—TANNING AND COLORING SHEEP SKIN.—Jonas Diehl, East Freedom, Pa.

I claim a tanning and coloring liquor, composed of the ingredients and mixed in the proportions about as specified, for tanning and coloring sheepskins, as set forth.

75,536.—MEDICAL COMPOUND.—Oscar G. Ditmars, New York city.

I claim the medicine herein described, called "The American Cough Balm."

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75,537.—MEDICAL COMPOUND.—Oscar G. Ditmars, New York city.

I claim the medicine herein described, called "The American Dyspepsia Cure."

75,538.—MANUFACTURE OF FLUORIDE OF SILICIUM.—Cyprien Marie Tessié Du Motay, Metz, France, and Edouard Karcher, Saarbruck, Prussia.

We claim the manufacture of fluoride of silicium, by reducing the oxygen of silica by means of carbon or carbonated compounds in presence of fluoride of calcium, substantially in the manner herein described.

75,539.—CHURN.—George C. Fitch, Randolph, N. Y.

I claim the arrangement of the buckets, D D, provided with four elongated lips, as described and used upon the arms, C C, in the box, A, substantially as specified.

75,540.—MACHINE FOR PAPERING PINS.—Thaddeus Fowler, Seymour, assignor to the United States Pin Company, New Haven, Conn.

I claim, 1st, The pointed cut-offs, s, applied at the lower ends of the conductors, in combination with the stock bar, r, substantially as and for the purposes set forth.

2d, The grooved breast, c, and spring door, i, in combination with the rake k, substantially as and for the purposes set forth.

75,541.—FUNNEL AND GRATER.—E. A. Goodes (assignor to himself, E. L. Miller, and W. H. Morford), Philadelphia, Pa.

I claim, 1st, The corrugated rim, f, around the top of the funnel, and the serrated edge, e, of the nozzle, B, in combination with a funnel, substantially as and for the purposes described.

2d, The handle, C, with the perforations or grater, g, and the wing, h, with the serrated edge, in combination with a funnel, substantially as and for the purposes set forth.

75,542.—BRICK MACHINE.—Wm. A. Graham, Carlisle, Pa., assignor to himself and Chs. Carr, Trenton, N. J.

I claim, 1st, The combination of the shafts, N R, knife, P, and rollers, n n, with the wheels, C C', when constructed and operating as specified.

2d, The rock shaft, I, with its upper and lower curved arms, L M, presser, O, and spring, m, when used with the wheel, C', as set forth.

3d, The combination of the solid faced wheel, C, brick mold wheel, C', plungers, i i, segment, K, rock shaft, I, with its arms, L M, shafts, N R, knife, P, cam, F, and belt, E, the various parts being constructed and operating substantially as and for the purposes set forth.

75,543.—POTATO DIGGER.—A. Hadwen, Rochester, N. Y.

I claim the arrangement of the rotary screen, F, arm, A', pulley, S, in combination with the belt, T, substantially in the manner herein shown and described and for the purposes set forth.

2d, The arrangement of the scraper, D, eccentric cam, y, in combination with shovel plow, E, substantially in the manner and for the purposes herein shown and described.

3d, The arrangement of the latch, B, in combination with the sides, C, for the purposes herein shown and described.

75,544.—SPIRAL GEARING.—Uri Haskin, Jr., Pittsburgh, Pa.

I claim spiral toothed gearing, consisting of teeth which run around the periphery of the gear wheel and meet in an angle on a line midway from either edge of the wheel, constructed and arranged substantially as herein-before described.

75,545.—SHUTTLE BINDER.—F. Haskins, Ware, Mass.

I claim the tapering supporting piece, A, in combination with the friction piece, B, screws, d and e, and nuts, b and f, the whole arranged and operating substantially as described.

75,546.—PEN HOLDER FOR RULING MACHINE.—I. W. Henderson, Leavenworth, Kansas.

I claim, 1st, A holder for pens consisting of the two arms, B and C, hinged together, substantially as and for the purpose described.

2d, The set screw, I, in combination with the above, substantially as and for the purpose specified.

3d, The combination of the arms, B and C, each adapted to receive a pen or pens, and set screws, G L, substantially as and for the purpose described.

75,547.—CAN FOR PUTTING UP ALKALI.—P. Hickey (assignor to himself and R. Porter), Philadelphia, Pa.

I claim setting the heads into alkali, paint, or other similar cans, by means of the flanges, 2, 3, 4, and a collar, D, encircling the body, so that said heads may be permanently and tightly set into the body while full, and sitting in an upright position, substantially as described and for the purpose set forth.

75,548.—HORSE RAKE.—J. N. Hicks, Barre Center, N. Y.

I claim, 1st, The revolving wire toothed rake head, formed of the bar, A, and the teeth, B B, etc., in combination with the arms, C C, and the lever, G, substantially as shown and described and for the purpose set forth.

2d, The ratchet, K, and pawl, L, in combination with the lever, O, operating for the purpose and in the manner shown and described.

3d, The lever, G, in combination with the arms, C C, operating for the purpose and in the manner above shown and described.

75,549.—PRIVY.—Jas. Ingram, New York city.

I claim a sliding clearer, combined with a stationary grating in a privy vault or sink, for the purposes and substantially as set forth.

75,550.—OYSTER TONGS.—J. Johnson, Brooklyn, N. Y.

I claim, 1st, The pair of toggle bars, g h, jointed to the ends of the tongs, d e, substantially as specified, so that the tongs will be closed by drawing up the joint between the bars, g h, or opened by drawing the joint between the bars d e, toward the said joint, between the bars, g h.

2d, In combination with the toggle bars, g h, and tongs, e d, as aforesaid, the pole or bar, m n, and the ropes or chains, k l, substantially as and for the purposes specified.

75,551.—PORTABLE FENCE.—Sebastian Keller, Elizabethtown, Pa.

I claim the mode of supporting portable fencing, as herein described.

75,552.—ADJUSTABLE JAW FOR VISE.—Henry N. King, Adrian, Mich.

I claim the combination of the stationary jaw, A, the movable jaw, B, the plate, C, the bolt, D, the ball, E, the collar, F, the plate, G, the face plate, H, the adjustable stops, I, and projecting standard, when constructed, arranged and operating substantially as and for the purposes herein set forth.

75,553.—FURNITURE DRAWERS AND FASTENERS.—John Koch Brookline, Mass.

I claim the combination of the inclined plane or lever, k, the spring, e, and the bolt, H, made with hooks arranged to catch upon the drawers, as specified, such combination being arranged in manner and so as to operate with the drawers, as explained, and being what I term the primary, or bolting, or fastening mechanism.

Also, the combination of the bar, I, the spring, K, the notch, L, the knob, o, the ratchet, p, and the pawl, q, as arranged with a drawer and its case, substantially as set forth, such combination being what I term the auxiliary fastening mechanism.

Also, the arrangement of the primary and auxiliary fastening mechanism with the series of drawers and their case, all as described for the purposes set forth.

75,554.—BELTING.—H. Lemaistre, Brussels, Belgium.

I claim, 1st, The manner herein shown and described of uniting pieces of leather for making belts by tapering their ends and leaving a lip, a, on every other end, as described, and uniting them by the means hereinafter described.

2d, Cutting the ends of leather straps, substantially in the manner described so that they can easily be united for belting, as set forth.

75,555.—PROPAGATION AND TREATMENT OF HOUSE PLANTS.—William Lilley, Washington, D. C.

I claim propagating and treating house plants in the manner and by the means substantially as and for the purposes herein set forth.

75,556.—WINDOW SASH.—Joseph Liness, Chicago, Ill. Antedated February 28, 1868.

I claim, 1st, Construction of a sash, with a filling of bars and mullions, with a removable outer section, I F, and a removable inner section, E D, so that one or both may be removed without disturbing the frame, substantially as specified.

2d, The cross bar or plate, H, when placed across the intersection of the bars and mullions on the inside, so as to be concealed when the sash is put together, substantially as shown.

3d, The method of securing the removable bars and mullions in the frame, by means of the strips, D, made with bevelled or coped ends, to fit over the corresponding bevel or molding of the bars and mullions, substantially as specified.

75,557.—BOTTLE FAUCET.—William I. Luther (assignor to Luther & Brown), Rochester, N. Y.

I claim, 1st, An automatic faucet for champagne bottles, etc., in which the passage at the end of the screw self-closes in entering the cork, and self-opens when passed through the cork, substantially as herein set forth.

2d, The combination of the independent stop cock, d, with the automatic point, f, and screw, b, operating substantially as and for the purpose specified.

3d, The special construction and arrangement of the parts, consisting of the case, A, cock, d, screw, b, point, f, shank, g, cross head, h, and spring, k, operating as described and for the purpose set forth.

75,558.—MODE OF FORMING RAISED ORNAMENTS ON WOOD.—James B. Macduff, New York city.

I claim raising ornaments upon wood by means of the knife, A, and follower, B, operated as described, whereby the knife is forced into the wood and removed, and the follower, B, applied to compress the ornaments, which, after the blank is sawed off, are raised to the desired hight by steaming, as herein shown and described.

75,559.—MACHINE FOR DRESSING FLAX.—William C. McBride, Somerville, N. J.

I claim, 1st, The toothed wheels, I, in combination with the revolving disk, E', and feeding rope, F', all constructed, arranged, and operating as herein shown and described.

2d, The arrangement of the oblique finger above the carrying disk, E', and cord, F', for the purpose of depositing the upper end of the fiber upon the surface of the disk, substantially as set forth.

3d, The beaters, G G, constructed as described, having two opposite straight sides and two curved sides, convex in the center and concave at the edges, all arranged and operating as described for the purpose specified.

4th, Providing the straight sides of the beaters, G G, with oblique rounded teeth, c e, as herein described, for the purpose specified.

5th, The revolving comb wheels, f and f', arranged so as to straighten the fibers after they are discharged from the scutching chamber, substantially as and for the purpose herein shown and described.

6th, The toothed disk, J, when arranged as described, for the purpose of taking the dressed flax from the rope, F, and depositing the same upon the table, L, as set forth.

75,560.—INSECT DESTROYER.—Alexander McKenzie, Henry, Ill.

I claim the solution, composed substantially as herein described, and applied in combination with iron, substantially as and for the purposes specified.

75,561.—VERMIFUGE.—John McKinsey, Millville, N. J.

I claim a vermifuge or worm medicine, composed of the ingredients (and in about the proportions), named, or substantially as described.

75,562.—CLOTHES POUNDER.—Bevel S. Morgan, Delhi, Iowa.

I claim the construction of the two pieces of wood, D D and E E, the hollowed surface of each of the two sections of the head, C C, forming the cavity, C, when closed, as and for the purpose specified.

75,563.—CUTTING SAW TEETH.—James Morton, Philadelphia, Pa.

I claim a tooth-cutting machine, consisting of the two toothed revolving circular dies, D and E, geared together and moving in opposite directions, substantially as herein shown and described.

75,564.—CASTER FOR FURNITURE.—Hezekiah Munroe, Fall River, Mass.

I claim the construction and arrangement in the case, E, of the friction rollers, c c, upon the vertical screws, a, and adapted to bear and revolve against the shank of the spindle, B, below the collar, d, and above the bottom plate, b, without contact with the top or bottom of the case, E, as herein described for the purpose specified.

75,565.—LAMP BURNER.—George Neilson, Boston, Mass.

I claim, 1st, The combination, with the wick tube, of a deflector, and an air-supply cylinder for supporting the same, when the said cylinder constitutes at the same time the rest or seat for the lamp chimney, as herein described.

2d, The combination, with the wick tube and elevated deflector, or a cylinder, forming at once the rest for the deflector and the lamp chimney, and supported upon a perforated air-distributing plate or diaphragm mounted upon the wick tube, substantially as herein described.

3d, The combination, with the wick tube and air-distributing plate or diaphragm mounted thereon, of the deflector and combined air-supply cylinder and chimney rest, when the latter is detachable and removable from the said diaphragm and wick tube, substantially as herein shown and described.

4th, The combination, with the air-supply cylinder, when constituting at the same time the chimney seat or rest, of springs for supporting the chimney in position, substantially as herein specified.

5th, The combination with the wick tube of the air distributor or diaphragm and the receptacle or cup formed in that part of the said diaphragm immediately surrounding the wick tube, as and for the purposes herein shown and set forth.

75,566.—LAMP BURNER.—George Neilson, Boston, Mass.

I claim the combination with a lamp burner in which the base or chimney rest is combined with an elevated deflector, as herein specified, of a globe frame, adjustable upon or permanently united with the said chimney rest, substantially in the manner and for the purposes shown and set forth.

75,567.—GANG PLOW.—William Nelson, Cacherville, Cal., assignor to himself, C. E. Moore, and A. J. Praster.

I claim, 1st, The attaching of the plow beams, N N, to the axle, A, by means of the boxes, L L, constructed substantially as shown, in combination with the frame, C, to which the draft-pole D, is attached, said frame being connected to the axle, A, as shown, and all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The notched segment bar, G, in combination with the lever H, and arm J, connected by the chain, I, and attached respectively to the draft pole D, and the axle A, and all arranged to operate in the manner substantially as and for the purpose specified.

3d, The yokes or frames, O, provided with the screws, , and attached to the lower plates, b, of the boxes, L L, with the plow beams, N, passing through them, substantially as and for the purpose set forth.

75,568.—FILE.—Hiram B. Nickerson (assignor to himself and Stillman B. Allen) Boston, Mass.

I claim a rasp having the teeth of each range of teeth disposed obliquely to the edges of the rasp, and so that the cutting face of each tooth shall have its obliquity arranged in a direction opposite to or about at right angles with that of each of the teeth of the next adjacent range, the whole being substantially as exhibited in fig. 1, and as hereinbefore described.

75,569.—DOOR LOCK.—Hiram Norton, Delton, Wis.

I claim the employment of two or more tumblers, a, having their center of movement at or near their middle points, and having their ends catching into notches, n n''', on the bolt, B, all substantially as and for the purpose shown and described.

75,570.—HARVESTER RAKE.—Elias Ogden, Lynchburg, Va.

I claim the combination of the two crank wheels, B, two cranks, F H, staple or slotted arm, G, and L-shaped rake, E, with each other, substantially as herein shown and described, and for the purpose set forth.

75,571.—APPARATUS FOR LEACHING BARK AND OTHER MATERIALS.—S. J. Patterson, Bridgeport, Conn.

I claim, 1st, A horizontal cylindrical revolving leach, A, constructed with a removable screen or strainer, C, and with openings, a1 and a2, substantially as herein shown, and for the purpose set forth.

2d, The combination of the perforated hollow shaft, D, with the cylinder, A, substantially as herein shown and described, and for the purposes set forth.

3d, The combination of the supporting friction rollers, G, with the revolving cylindrical leach, A, substantially as herein shown and described, and for the purpose set forth.

75,572.—MUSICAL NOTATION.—Philetus Phillips, Matawan, N. J.

I claim the combination of the ordinary staff on which music is printed, with bars, which separate the measures, intersecting small portions of the staff formed on the principle of the patent of May 27, 1856, as above described.

75,573—MOWING MACHINE.—J. W. Pierce, Millbury, Mass.

I claim the pivoted bent lever, L, finger bar, K, rod, M, lever, N, and irons, I, in combination with the lever, G, all operating as described, whereby the inner end of the finger bar is raised by the lever, G, and its outer end by the lever, L, the whole constructed and arranged in the manner and for the purpose set forth.

75,574.—WAGON HUB, AXLE, AND BOX.—John W. Pollock, Cross Bridges, Tenn.

I claim, 1st, The combination of the hub, A, and the box, D, with each other, with the axle, C, substantially as shown and described, and for the purposes set forth.

2d, The combination of the box, D, with the axle, C, substantially as shown and described, and for the purposes set forth.

75,575.—COMBINED SEEDING MACHINE AND CULTIVATOR.—O. M. Pond, Independence, Iowa.

I claim, 1st, The seed box, D, provided with an adjustable bottom, E F, and slide, G, in combination with the fluted feed roller, I, for the purpose and in the manner as set forth.

2d, The cultivators, O, adjusting bar, P, check bar, C', as constructed and arranged to operate in relation to the seed box, D, for the purpose substantially as described.

75,576.—VISE.—Mason Prentiss, Cambridge, N. Y.

I claim the improved vise herein described, its several parts being constructed and arranged substantially as set forth.

75,577.—MANUFACTURE OF GLASS.—Daniel C. Ripley, Pittsburg, Pa.

I claim a glass or porcelain pressed top, for sirup or cream jugs or pitchers, substantially as described.

75,578.—CULTIVATOR.—Eleazer B. Roberts, Rochester, N. Y.

I claim, 1st, The application to cultivators, of rotary weed cutters hung on a vertical shaft, and operating substantially in the manner herein shown and described, and for the purposes set forth.

2d, The application to cultivators of rotating hoes hung on a vertical shaft, and operating substantially in the manner herein shown and described, and for the purposes set forth.

3d, The arrangement of the arm, M, in combination with the rotary hoe, D, substantially in the manner and for the purposes herein shown and described.

75,579.—EXTENSION WARDROBE.—J. G. Roux, Crystal Springs, Miss.

I claim, 1st, An extension wardrobe, constructed substantially as shown and described.

2d, The drums or boxes, A A', sliding horizontally, substantially as and for the purpose shown and described.

3d, The movable uprights, G G' G'', substantially as and for the purposes shown and described.

4th, The frames, B B', supported by a post, D, substantially as and for the purposes shown and described.

5th, The hollow post, D, substantially as and for the purpose shown and described.

6th, The vertical shaft, a, with its pinions, s s e, in combination with a wardrobe, substantially as and for the purposes shown and described.

7th, The channels, H, in combination with the racks, r r, substantially as and for the purposes shown and described.

8th, The uprights, G G' G'', in combination with the notched feet, u u' u'', substantially as described, for the purposes specified.

9th, Connecting two parts, A A', of a wardrobe with racks, r r, substantially as and for the purposes shown and described.

75,580.—DEVICE FOR LASTING BOOTS AND SHOES.—Joseph G. Rust, Xenia, Ohio.

I claim the piston, D, and the lever H, and the click, L, in connection therewith, in combination with the piston, D, all arranged substantially in the manner as and for the purposes herein set forth.

75,581.—RAILROAD FREIGHT CAR.—L. Savage, Ashtabula, O.

I claim, 1st, The construction and arrangement of freight cars in two parts, the upper part or freight receptacle, B, being made separate and removable from the lower or running part, A, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the metallic grooves or channels, D, and friction wheels, E, with either or both the parts A and B of the car, and with the trestles or platform, C, for the purpose of diminishing the friction in moving the said part, B, substantially as herein shown and described.

75,582.—VESSEL FOR MINERAL WATER.—A. D. Schnackenberg, Brooklyn, N. Y.

I claim a cap, C, for mineral water boilers, or jars, when provided with a valve, d, and upright or nearly upright tube, F, substantially as herein shown and described, so that the use of a draft tube is dispensed with, as set forth.

75,583.—RAILROAD RAIL FASTENING.—M. Seaman, Middleport, N. Y.

I claim the construction and arrangement of the intermediate section, B, provided with the head, b', resting upon the flanges, d d, of the rails, A A, its sides or ends, a a, projecting from the middle in opposite directions, one over the outer side of one of the rails, A, and the other over the inner side of the opposite rail, A, the point of connection of the ends of the rails, A, and intermediate rail, B, fitting into each other at an oblique or diagonal angle, when all are constructed and arranged as herein set forth, for the purpose set forth.

75,584.—LUBRICATING DEVICE.—Mathew Senior, Frankford, Pa.

I claim lubricating the feather, D, upon the shaft, C, from each side of said feather, through the holes, e e, in the tubular journal, B, and the hole, f, in the hollow cap, g, as herein described for the purpose specified.

75,585.—BASE-BURNING STOVE.—S. B. Sexton, Baltimore, Md.

I claim, 1st, The flaring or funnel-shaped chamber, H, constituting the magazine and intermediate outer wall of the stove, in combination with the contracted passage, J, substantially as and for the purpose described.

2d, The arrangement of the air-heating chamber, E, applied around the fire pot, D between the base and top of said pot, with a coal reservoir, which constitutes the single exposed outer intermediate wall of the stove, and is united to the fire pot by an inclined illumination ring, G, substantially as and for the purpose described.

3d, An upwardly-flying coal reservoir, exposed as described, provided with a supporting ring, G, having door or window openings through it, and arranged over a flaring fire chamber or pot, substantially as described.

75,586.—SURGICAL SUPPOSITORY.—H. H. Seys, Oil City, Pa.

I claim, 1st, A suppository, which, while it acts in the rectum as a pessary and valve upon the blood vessels, shall impart the medicinal properties of which it is composed to the diseased vessels, substantially as described.

2d, A suppository composed of linseed meal or pulverized oil cake, or the two combined in proper proportions, or other similar oleaginous or mucilaginous vegetable material alone, or mixed with suitable anodyne and astringent medicines, formed into a conoidal-shaped mass, so that when introduced into the rectum it shall produce the effect as herein shown and described.

75,587.—LAMP.—Samuel Shea and E. W. Gillman, Long Island City, N. Y.

We claim, 1st, Providing a lamp burner with a removable ratchet and arbor, substantially as herein shown and described.

2d, The sleeve, E, when arranged around a burner, A, in which a hole, a, is provided, to allow the insertion and removal of the ratchet and arbor, substantially as herein shown and described.

75,588.—PORTABLE BOOK CLAMP.—Calvin W. Sherwood, Chicago, Ill.

I claim, 1st, A book grapple, consisting of the bars A and C, with the cord, E, and windlass, F, with the stops, a, all constructed and arranged to operate substantially as described.

2d, In combination with a grapple for holding the books, the box, B, constructed and arranged for use, substantially as herein described.

75,589.—CIDER PRESS.—A. W. Shidler, South Bend, Ia.

I claim the tubes, G, and head, C, in combination with the perforated or open sides, A, bottom, B, and screw, D, arranged and operating in the manner and for the purpose substantially as set forth.

75,590.—HORSE COLLAR.—J. H. Sperbeck, Warsaw, N. Y.

I claim the combination of the elongated ears, E D, with the hameless horse collar, as described, when constructed substantially as set forth.

75,591.—MECHANICAL MOVEMENT.—M. F. Spore, Preble, N. Y.

I claim, I, The arrangement of the escapement pallets upon a pivoted arm or lever, and employing the same thus arranged in combination with a clock mechanism, as a means for operating a pump, churn, or other similar machine, substantially as herein described.

2d, The arrangement of the shaft which carries the pinion and spur wheels which transmit the power of the clock movement to the crank shaft, upon the frame, A, and upon a hand lever, in such a manner that said wheels can be thrown out and in gear with the clock movement, substantially as described.

3d, The arrangement of the train of gearing herein described, hand-adjusting levers, pendulum, weight, and reciprocating slide, all substantially as and for the purpose set forth.

75,592.—WASHING MACHINE.—Edmund Stair, Harrisonville, Mo.

I claim a washing machine consisting of the tub, A, corrugated washboard, C, grooved transversely at F, pivoted end pieces, D, connecting rod, d', notched connecting bars, E, and ribs, F, all constructed, arranged, and operating as set forth.

75,593.—HARNESS TRACE.—Robert J. Steele, Jr., Rockingham, N. C.

I claim a harness trace, A B, made of flat bars of metal, coated or covered with any suitable material, the extremities of the trace being provided with links, a f, and the parts, A B, being coupled together by means of the hook, c, and eye, d, substantially as described, for the purpose specified.

75,594.—FIRE POT FOR STOVES.—David L. Stiles (assignor to Augusta P. Stiles), Rochester, N. Y.

I claim the combination, with a fire pot formed of a series of staves, of passages formed in said staves, which will allow air to pass directly through the wall of the fire pot from the base, as herein set forth.

Also, in combination with a fire pot made of a series of staves, and having air passages passing directly through the walls of the fire pot from the base, a series of perforations, slots or equivalent passages, opening through the whole interior of the fire pot to admit air to burn the gases, as herein set forth.

75,595.—CATTLE STALL.—Stephen D. Stone, Warwick, R. I.

I claim placing the bar, A, or its equivalent, in the position with regard to the animal in the stall, substantially as herein described and for the purpose set forth.

75,596.—BRICK MACHINE.—John Taggart, Jr., Roxbury, Mass., assignor to himself, Isaac Ames and Alfred G. Taggart, and Alfred G. Taggart, assignor to Sarah P. Taggart.

I claim the combination of the endless former, H, constructed substantially in manner as described, the top and bottom covering plates, y K, and one or two plates or reducers, I I, arranged in manner and so as to operate with it, as explained.

Also, a clay reservoir, A, as made with the plunger and semi-crescential clay-receiving recesses or chambers, V, arranged at its ends, and provided with discharging openings leading therefrom, as explained.

Also, the combination of the two plungers, F F, and their operative mechanism, with the clay reservoir, A, and its mechanism, for stirring and mixing the clay.

Also, the combination as well as arrangement of the endless former, H, constructed substantially as described, the platform, K, one or more reducers, I, the reservoir, A, and mechanism for mixing the clay therein, and mechanism for expelling it therefrom into the molds and pressing mechanism, substantially as described.

Also, the combination of the discharging roller, U, and its operate mechanism, with the platform, K, the endless former, and the reducer or reducers, I I, applied thereto, substantially in manner and so as to operate as described.

75,597.—HORSE POWER.—Henry Tarpley, Wesley, Ky.

I claim the combination of the endless platform horse power, C, with the cait, A, and the reciprocating saw, H, all arranged in such a manner that the horse power may be rendered available for propelling the machine along from place to place, and also for driving the saw, as set forth.

75,598.—STEAM ENGINE BALANCE SLIDE VALVE.—Waldemar Thilmany, Cleveland, Ohio.

I claim, 1st, The arrangement of the valve, J, plate, K, lugs, c, and passages, d d', with reference to the cylinder, A, substantially as specified.

2d, The pistons, A', as constructed and arranged in relation to the plate, K, substantially as set forth.

75,599.—METHOD OF HANGING SIEVES AND SCREENS.—Sam'l Thompson, Ballston Spa, N. Y.

I claim suspending or supporting a frame, e, or tray, or box, or other vessel, by two or more pairs of diverging rods or chains, substantially as shown and described, or their equivalent thereof, for the purpose of producing in the said frame, tray, box or other vessel the peculiar compound agitating motion, as above set forth.

75,600.—SEED PLANTING MACHINE.—Frederick W. Tilton, Moline, Ill. Antedated March 7, 1868.

I claim the adjusting screw bolt, C, having a recess or groove, c3, as represented, in combination with the section or crown, D, fixed on the outer shaft, A, and section or crown, E, having an inward connection to the interior shaft, A', all arranged substantially in the manner and for the purposes herein set forth.

75,601.—SEED SOWER.—Frederick W. Tilton, Bristol Station, Ill. Antedated March 7, 1868.

I claim in a said planting machine, so arranging the sleeve, E, as to perform the double function of carrying the seeding devices, and of supporting the weight of the machine, substantially as above set forth.

75,602.—SHOE KNIFE GUARD.—G. G. Townsend, Rochester, N. Y.

I claim the skeleton guard, G, for shoemakers' trimming knives, consisting of the lip, g, shank, s, frame, f, and encircling bar, b, in combination with the binding screw, s, substantially in the manner and for the purposes herein set forth.

75,603.—MINER'S LAMP.—George W. Tremble (assignor to himself, E. Hughes and Wesley Buckel), Bloomsburg, Pa.

I claim providing the tube or spout of a mining and furnace lamp with a feed device for the wick, substantially as described.

75,604.—GLASS MOLD.—David Turpie, Sandwich, Mass., assignor to "Boston and Sandwich Glass Company."

I claim a glass mold constructed and arranged to operate substantially as and for the purpose described.

75,605.—VEGETABLE CUTTING AND MASHING MACHINE.—Carl Vignal, New York city.

I claim the combination of the removable truncated cone, D, provided with the graters or cutters, c, the revolving curved gathering shield, E, rest, F, and hinged bearings, b, said cones and shield revolving upon the shaft, B, independently of each other, all constructed and arranged to operate as herein described for the purpose specified.

75,606.—HARVESTER.—Lorenzo Wallace, Leavenworth, Kansas.

I claim, 1st, The spokes, a b, in combination with the bent levers, I I', adjustable hand lever, H, connecting rods, J J, vibrating rod, K, connecting rod, L, and cutter bar, M, as herein described for the purpose specified.

2d, The attaching of the bent levers, I I', to the hand lever, H, arranged substantially as shown, and provided with a spring catch, g, for the purpose of rendering the cutter bar inoperative whenever desired.

75,607.—GATE.—Wilber S. Wandell, Battle Creek, Mich.

I claim the pins, m m', upon the spring, h, in combination with the weighted gate, A, and pin, n, whereby as the pin, m', is withdrawn by the spring, h, the gate is permitted to swing into a horizontal position upon the pins, m n, for the passage beneath it of hogs or sheep, as herein shown and described.

75,608.—EXTRACTING TANNIN FROM BARK.—Gardner Warren, Boxbury, Mass. Antedated March 6, 1868.

I claim, 1st, The method of treating bark for the purpose of obtaining its tanning or other qualities, by the three operations of steaming, soaking and squeezing the same, substantially as described.

2d, The method of preparing several qualities of extracts from the same bark, by preserving the products of the several successive pressings separate from each other, substantially as described.

75,609.—CLEARER FOR RING SPINNING MACHINE.—Joseph W. Wattles, Canton, Mass.

I claim the combination of the rotary toothed ring cleaner with a ring and traveler and the ring rail.

Also, the rotary ring cleaner, G, as composed of the toothed wheel or series of teeth, and the shank or supporting rod thereof, when the same are for use, with a ring rail and its ring and traveler, as set forth.

Also, the arrangement of a ring cleaner, substantially as described, between two next adjacent rings, so as to serve as a means of cleaning both the travelers thereof.

Also, the application of a ring cleaner to the ring rail, so as to be movable vertically up to or near to the path of the ring during a descent of the ring rail, and be depressed below or away from such path during ascent of the rail, as set forth.

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Also, the application to the ring rail of a traveler cleaner or toothed wheel or series of teeth, so as to be capable of being freely revolved, as well as of being raised and depressed relatively to the ring rail, and a ring and traveler thereof, in the manner and for the purpose specified.

75,610.—RING AND TRAVELER SPINNING MACHINE.—Joseph W. Wattles, Canton, Mass,

I claim the ring receiver constructed substantially as described, that is to say, not only with a shank to fit the rail socket, and with a bore eccentric, with the cylindrical outer surface of such shank, as described, but also so as to be capable of being sprung or contracted upon the shank of the ring by the screw inserted in the rail, and employed to confine the receiver in the socket of the rail, as set forth.

75,611.—SAD-IRON HOLDER.—Joseph Davis Westgate, San Francisco, Cal.

I claim a sad-iron holder, constructed with pockets for the thumb and fingers, and with an interlining of gypsum, or other similar non-conducting substance, in combination with a shield, B, having a similar interlining or covering, substantially as described.

75,612.—WINDOW NETTING.—John R. Wharry, Moundsville, W. Va.

I claim, 1st, The slotted netting frames, C, and slip hinges, e, in combination with any window casing, A, substantially as shown and described and for the purposes set forth.

2d, The hooks, d, and blinds, B, in combination with the netting frames, C, and staples, e2, substantially as shown and described and for the purposes set forth.

75,613.—SEED PLANTER.—Sylvanus C. Wilder, Sardinia, O.

I claim, 1st, The combination of the curved bar or stem, S, lever, T, spring, C, connecting bars, U, rock shaft and arms, V v1 v1, double jointed connecting rod, W, rock shaft and arms, X x1 x2, and treadle bar, Y, with each other and with the seed boxes, O, and slotted beam, A, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the lever, Z, sliding bar, A', and slide post or rest, B', with each other and with the treadle bar, Y, substantially as herein shown and described, and for the purpose set forth.

75,614.—DRIVING LINE.—L. D. Woodmansee, Dayton, O.

I claim, 1st, The check lines, b b, extending rearward, and forming loops, d d, for the hands of the driver, in combination with the lines, a a, in the manner and for the purpose described.

2d, The lines, a and b, constructed and connected in the manner described, in combination with the bit, A, for the purpose described.

75,615.—HAMMER.— Horace H. W. Wright (assignor to himself, James Morse, Richard S. Jenness and Albert Pickernell), South Boston, Mass.

I claim a reversible screw driver, with shoulders, secured by a spring in a socket in the end of a hammer handle, constructed and arranged substantially as described.

75,616.—SEED PLANTER.—R. B. Wright, Vermillion, Ill.

I claim, 1st, The connecting of the seed slides, h h, by a rod, j, which is attached to a rod, k, parallel with j, by links, l l, and the connecting of the rod k, to a swinging or pivoted yoke, K, which is actuated by the dropper, thro' the medium of a lever, L, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

2d, The sliding or adjustable seats, M N, in combination with the two pairs of wheels, B B C C, all arranged substantially in the manner as and for the purpose specified.

3d, The connecting of the dratt pole, I, to the frame, A, by a chain, f, in addition to the usual joint, e, for the purpose of limiting the upward tilting movement of the front part of the frame, substantially as set forth.

75,617.—ROCKER FOR CHAIR.—L. B Yale, Bainbridge, N. Y.

I claim, at a new article of manufacture, a metallic rocker, A, for chairs, when made angular in its transverse section, and provided with a series of holes, c, near each end, as described for the purpose specified.

75,618.—LOW WATER DETECTOR FOR STEAM GENERATOR.—William W. Bailey, New York city.

I claim, 1st, The tension valve opener, in combination with an expansive tube, fitted and operating substantially as and for the purposes set forth.

2d, The combination of an expansive tube with the tension valve opener and alarm whistle, substantially as set forth.

75,619.—PRINTERS' GALLEY.—W. G. Blymyer, Findley, O.

I claim the slot, B, and set screw, C, applied to a printers' galley, substantially as and for the purpose set forth.

75,620.—FEEDING NAIL PLATES.—F. E. Boyd, Boston, Mass.

I claim, 1st, The movable nipper rod, F, in combination with the rack bar, I, head, K, sliding block, M, and pawl, l, substantially as and for the purpose specified.

2d, The combination of the holder or barrel, D, provided with the projection or pin, and the wheel, B B' B, substantially as and for the purpose set forth.

3d, The tilting frame, A' A', in combination with the holder or barrel, D, rack bar, I, and wheel, B B' B, as and for the purpose specified.

75,621.—CHURN.—Eugene T. Brownfield, Smithfield, Pa.

I claim, 1st, The top, H, when provided with the funnels, J J J J, and shields, P P P P, substantially for the purpose set forth.

2d, Dasher, B, constructed with oblique slats, substantially as herein described.

3d, The dasher, B, in combination with axles, m and e, slide, k, and lever, c', the whole constructed and arranged substantially as specified.

75,622.—APPARATUS FOR TEMPERING CREAM PREPARATORY TO CHURNING.—Eugene T. Brownfield, Smithfield, Pa.

I claim the within-described process for tempering or souring cream or milk, when effected by devices constructed and arranged substantially as set forth.

75,623.—SUSPENSION EGG CARRIER.—Abner H. Bryant, Wilmington, Del.

I claim a suspension egg carrier, composed of cloth pouches for holding single eggs, suspended between meshes of cords or twine, laced through the sides of the wooden trays set in a wooden holder, constructed and arranged as set forth by the drawings.

75,624.—MACHINE FOR STRAPPING AND GRINDING CARDS.—William H. Chandler, North Scituate, R. I., assignor to himself, John Wheeler and Earl D. Barden.

I claim the combination of a slot, L, in the traveler, A, with a stud, K, belt, J J, and pulleys, I I', gear wheel, H, and worm, G, substantially as and for the purpose specified.

75,625.—FIXED AMMUNITION HOLDER FOR CARTRIDGE BOX —John Webster Cochran, New York city.

I claim the cartridge holder, constructed with the series of separately-grooved sockets, a, formed and arranged in relation with each other, substantially as and for the purposes specified.

75,626.—FIXED AMMUNITION HOLDER FOR CARTRIDGE BOX. —John Webster Cochran, New York city.

I claim the plates, A* B*, recessed as described, in combination with the frame, A, substantially as and for the purpose specified.

75,627.—BREECH-LOADING FIRE-ARM.—J. Webster Cochran, New York city.

I claim, 1st, The external shield, I, in combination with the recoil bolt, constructed and operated as described substantially as and for the purpose specified.

2d, The firing pin, J, in combination, substantially as described, with the recoil bolt, F, and the hammer or striking device, whereby, when the recoil bolt is turned preparatory to opening the breech, the firing pin shall be turned or brought out of line or contact with the said hammer or device, substantially as and for the purpose specified.

3d, The head, d*, of the firing pin, arranged in relation with the recess, e*, and the hammer, substantially as and for the purpose specified.

4th, The arrangement of the head, d*, of the firing pin with reference to the recessed portion, i*, of the hammer, substantially as and for the purpose specified.

75,628.—REAMING TOOL.—Alexander Conklin, Hartford, Ct.

I claim the combination of the devices, A B C D, constructed and operating substantially as described, when used to form an expanding tool, as herein specified.

75,629.—WASHING MACHINE.—John Cooper, Dublin, Ind.

Antedated March 6, 1868.

I claim the shaft, D, having the beaters, E, hinged to it, as described, when constructed and arranged to operate substantially as set forth.

75,630.—LIFTING HOOK, GUARD, ETC., FOR STOVES.—H. Pelham Curtis, Washington, D. C.

I claim the combination of shield, hook, and handle, marked respectively, A B and C, substantially in the manner and for the purposes herein described.

75,631.—APPARATUS FOR HEATING FLATIRONS.—Albert Hallowell, Lowell, Mass.

I claim the combination as well as the arrangement of the valne, d, and its stem, e, with the flatiron stand, A, and the gas burner, B, applied thereto, substantially as specified.

Also, the combination and arrangement of the adjustable deflector, k, with the valve, d, its stem, e, the flatiron stand, and the burner, arranged as set forth.

Also, the combination and arrangement of the conical flame guide, p, with the adjustable deflector, k, the valve, d, its stem, e, and the burner, B, or the latter and the flatiron stand, A, arranged as represented.

75,632.—HARNESS.—Alexander Harroun, Jr., South Onondaga, N. Y. Antedated March 4, 1868.

I claim the rod, a, Fig. 1, or its equivalent, when employed substantially as and for the purpose set forth.

Also, the arms, c, when connected by a common joint, or its equivalent, when employed substantially as and for the purpose set forth.

Also, the combination of the clasp, f, and the arm, g, or their equivalent, when employed substantially as and for the purpose set forth.

Also, the clasp, n, Fig. 2, and the arms, o, in combination, or their equivalent, when employed substantially as and for the purpose set forth.

75,633.—MACHINE FOR GRINDING HARVESTER KNIVES.—Josiah Y. Hoagland, Auburn, N. Y.

I claim, 1st, Affixing the machine for grinding the knives or sections of a harvester upon the frame of an ordinary grindstone, so as to bring the said knives or sections to the face of the stone to be ground, substantially as above described.

2d, The grooved platform, C, in combination with the bottom piece, D, and the standard, E F G, substantially as and for the purpose above described.

3d, The combination of the three parts, E F and G, of the standard, constructed and arranged substantially as and for the purpose described.

4th, The combination of the three parts, E F and G, with the holder, H I, so as to form a universal joint, substantially as and for the purpose above described.

5th, Attaching a spring to the bottom piece, D, so as to draw the cutter bar from the stone, substantially as described.

6th, The combination of the spring, a, the chain, b, and the lever, J, substantially as and for the purpose described.

7th, The combination of the spring, a, the chain, b, and the treadle, c, substantially as and for the purpose described.

8th, Attaching a spring to the bottom piece, D, so as to draw the cutter bar to the stone, making thereby an automatic presser, substantially as and for the purpose described.

75,634.—COMPOSITION FOR ROOFING.—John H. Wood, Danville, N. Y.

I claim a roof prepared as specified, and covered with the compound made in the manner described.

75,635.—ROTARY BLOWER.—C. W. Isbell, New York city.

I claim the revolving shaft, C, having one of the vanes, B, rigidly attached and the others loose thereon, and supported in journals in the arms, E, of the stationary shafts, F, in combination with the drum, D, and cylinder, H, all arranged and operating substantially as and for the purposes set forth.

75,636.—FENCE AND TRELLIS POST.—James Lamont, Pittsburg, Pa.

I claim, 1st, The combination, with a metallic post, a, for fences, trellis work, etc., of a recessed base or step, e, and a series of blocks, d, through which the post, a, passes, with or without the pins, f, in the manner and for the purposes substantially as hereinbefore described.

2d, The combination with a metallic post or stake, furnished with supports, d e, a trellis work consisting of cross bars, b, with ends, c, projecting upward, substantially as and for the purposes above set forth.

75,637.—GUIDE FOR HAT LINING IN SEWING MACHINES.—C. H. Lockwood, Hawleyville, Conn.

I claim the oval plate, H, provided with the oval concentric rim, I, in combination with the bar, C, provided with the rollers, D D, and the slot, a, and pin, d, or their equivalents, to serve as a guide for the plate, H, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

75,638.—MACHINE FOR STAMPING LETTERS.—J. C. W. Maas and Carl Fischer, Hamburg, Germany.

We claim, 1st, The roller, A, and holders, b, with their springs and cams, c, substantially as described.

2d, The cylinders, A and B, stamps, e, and yielding pressure device, f g, all substantially as described.

75,639.—FRUIT JAR.—A. D. McMaster, Rochester, N. Y.

I claim the cylindrical stopper, B, having its lower end annularly recessed and abruptly shouldered, and provided with an elastic gasket, c, in combination with an unshouldered but tapering-necked jar, provided with projections, d d, arranged with reference to the inclined lugs, f f, of the stopper, substantially in the manner and for the purposes set forth.

75,640.—HARVESTER.—Elijah W. Merrill, West Buxton, Me.

I claim the vibrating arm, d, in combination with and when set upon the swinging lever, x, together with the hand lever, f, and catch pawl, y, the head, a, and rod, e, when arranged as and for the purpose specified.

75,641.—MACHINE FOR STUFFING HORSE COLLARS.—E. B. Miller, Greeneville, Tenn.

I claim, 1st, The beds, Y Y, in the plattorm, B, when constructed and used in the manner and for the purpose specified.

2d, The fluted cylinder, N, substantially as and for the purpose set forth.

3d, Operating the cylinder, N, by means of the arms, shaft, R, crank, R', rod, U, dog, T, and ratchet wheel, S, in connection with the plunger, P, or traction rods, v v, when the several parts are constructed and combined substantially as and for the purpose described.

4th, The combination of the clamp, D, constructed and operating as shown and described, with the treadle, D, L, and connecting rod, L', in the manner and for the purpose shown.

5th, The swinging platform, B, having the clamp, C, rack, r and the beds, Y Y, substantially as and for the purpose described.

6th, The weighted basket, M, provided with an eye, m, and connected with the plunger, P, substantially as and for the purpose set forth.

7th, The slotted arm or lever, T, when used in combination with the clamp, t, dog, T', and ratchet wheel, S, substantially as and for the purpose described.

75,642.—GATE.—Peter L. Miller, Mechanisburg, Pa.

I claim the combination of the bell cranks, F H, rods, G G' I J, and levers, D D', with the latch, A'', all arranged and operating substantially as and for the purpose specified.

75,643.—SPRING WASHER AND SAFETY NUT.—Adrian V. B. Orr, Steeleville, Pa.

I claim the notched or ratchet nut, N, with its central bearing, n, in combination with the spring washer, W, the whole being constructed and operated as described and for the purpose set forth.

75,644.—FLUID METER.—John Powers and J. B. Van Deusen, New York city.

We claim, 1st, The double-acting cylinder, open at the ends, and made with a double partition near the middle, in combination with two pistons, connected by a rod and with the ports, 6 and 7, and valve, substantially as and for the purposes set forth.

2d, The arrangement of two or more cylinders, constructed as aforesaid, to operate upon one shaft, with two crank pins, at about ninety degrees to each other, to form a fluid meter, substantially as specified.

3d, The levers, w and v, connected to the valves, and operated from the shaft, r, by mechanism, substantially as specified, to move the valves in the manner set forth, in combination with the double-acting cylinders and their pistons, substantially as specified.

4th, A D or hollow valve, applied within the water space of the meter, and above the cylinder, in combination with an exhaust water way beneath the said valve, substantially as and for the purposes set forth.

5th, The trunk, l, extending across below the cylinders, f g, and connecting the water ways, k, with the delivery pipe, e', as and for the purposes specified.

6th, The case, a, formed with a receptacle for sediment below the operative parts, in combination with a cock or plug for the discharge of said sediment, substantially as set forth.

75,645.—COUPLING FOR SECTIONAL VESSELS.—Levi B. Raymond and William Hanley, Lockport, Ill.

We claim the combination of the coupling apparatus, consisting of the arm, c, pins, d, lever, i, and rings, e, with the hull of the sectional vessel, a a, when arranged and operating as and for the purposes set forth.

75,646.—BALANCE VALVE.—E. B. Requa, Jersey City, N. J.

I claim, 1st, The adjustable pitman, g, in combination with the working lever, F, shell, A, and valves, C C', constructed and operating as and for the purpose herein shown and described.

2d, The arrangement of the slotted hand lever, H, and thumb nut, K, with relation to the working lever, F, adjustable valve stems, and valves, C C', as herein described for the purpose specified.

75,647.—CULTIVATOR.—J. H. Reynerson, Pleasant Plains, Iowa.

I claim, 1st, The horizontal bar, I, vertical bars, H, rock shaft, K, having arms, f, arm, h, lever, L, and chain, g, in combination with the plow beams, F G, all arranged and operating as described, whereby the depression of the lever, K, raises the outer beams, G, through the medium of the arms, h f, and chain, g, and the inner beams, F, through the medium of the vertical bars, H, and horizontal bar, I, as and for the purpose herein set forth.

2d, The vertical bars, H, and horizontal bar, I, in combination with the plow beams, F G, and lever, L, as herein described for the purpose specified.

3d, The horizontal bars, H, attached to the inner beams, F, when the lower ends of said bars are provided with the projecting foot rests, d, arranged and operating as described for the purpose specified.

75,648.—MARINE PROPULSION.—Andrew J. Reynolds, Sturgis, Mich.

I claim, 1st, A propelling apparatus for vessels, acting upon the water in which the vessel floats, when driven by a water wheel of any suitable construction.

2d, The combination of the wheels, C C and D D, with the pivoted buckets, D', substantially as and for the purpose set forth.

75,649.—MANUFACTURE OF RUBBER TUBES AND MACHINERY THEREFOR.—John Robertson, Brooklyn, N. Y.

I claim, 1st, The rams, B B, having a compressing action, in common with each other, and hung so as to be capable of being swung out of line with their cylinders, substantially as and for the purpose or purposes herein set forth.

2d, The traveling core, H, in combination with the hollow core, F, and die, G, arranged for operation transversely, or thereabouts, to the axial line or lines of the gum compressing ram or rams, essentially as shown and described, and for the purposes specified.

75,650.—BUTTON FASTENING.—Max Rosenthal, Philadelphia, Pa.

I claim a button fastening formed of wire, bent and shaped as shown and described, and having the pointed end of the spiral turned upwards, for the purposes set forth,

75,651.—TEA AND COFFEE POT.—Michael Simons, Middletown, Conn.

I claim the construction of the sliding strainer with its round and convex center, E, to prevent the grounds from choking up the spout, as herein described and set forth.

75,652.—COMBINED SHOVEL AND TONGS.—H. C. Sisco, Indianapolis, Ind.

I claim the shovel and tongs, combined in one implement, provided with the spring, D, substantially as set forth.

75,653.—GAS METER.—A. W. Smith, Birmingham, Pa.

I claim, 1st, The construction of the wet gas meter, with the reservoir, E, the passages, G G G G, the double stopcock, H, with the bores, I I', and the cap, J, all arranged for the purpose and in the manner substantially as set forth and described.

2d, The manner of constructing the condensing well, A, the passage, B, and the cap, C, all arranged for the purpose substantially as set forth and described.

3d, The filler, K, constructed with the double stopcock, L, with the bores, N N', the extension tube, O, the swivel, M, the screw tube and plug, F, and the handle, Q, all arranged and operating in the manner and for the purposes substantially as set forth and described.

75,654.—THREAD TENSION MECHANISM FOR SEWING MACHINES.—Solomon Snyder, Harrisville, Pa.

I claim the tension apparatus above described, when its several parts are constructed and combined to operate substantially in the manner and for the purposes set forth.

75,655.—WATER METER.—E. Spencer (assignor to R. Westcott), Elizabeth, N. J.

I claim constructing the box containg the operation parts of the meter so as to form the heads of the cylinders and render the box itself water-tight, substantially as and for the purposes herein specified.

Also, the arrangement of the piston rods, g g, in the free guides, h h, in combination with connecting rods, i i, substantially as and for the purpose set forth.

75,656.—MANUFACTURE OF CRUSHED SUGAR.—C. Spreckels, San Francisco, Cal.

I claim the manufacture of the crushed sugar of commerce directly from the centrifugal machine, in the manner substantially as herein described.

75,657.—HAND ENGINE.—C. T. Ulmann, New York and M. Bockman, Brooklyn, N. Y.

We claim, 1st, The combination of handles, K, projections, I, levers, H, working beam, G, socket, E, and arms, L, when arranged as and for the purpose set forth.

2d, The main lever, E, when constructed as and for the purpose set forth.

3d, The combination of arms, D and C, and the triangular crank or quarter crook, B, when arranged as and for the purpose set forth.

75,658.—APPARATUS FOR RELIEF OF INVOLUNTARY DISCHARGE OF URINE.—J. S. Van Rensselaer, Albany, N. Y.

I claim the combination of the inclined bed, A, the India-rubber or other protecting covering, H, the tube, C, with its funnel, E, and the receiver, D, substantially as described, and for the purposes set forth in these specifications.

75,659.—CALENDAR.—A. S. Vose, Randolph, Vt.

I claim, 1st, The construction of the perpetual calendar, whereby it is adapted to be attached to and operated by any clock, by means of the hour hand and forked lever, substantially as described.

2d, The levers, s and J, combined with the plate, q, to set the month hand, e, from the last day of months of different lengths to the first day of the succeeding month, and to set the month of the year at the same time, substantially as described.

75,660.—PORTABLE BOOK CLAMP.—Wm. C. Watson Paterson, N. J.

I claim the drum or windlass, B, supported in suitable bearings at each end of the strip, A, provided with a ratchet wheel, c, and pawl, d, in combination with the strip, C, and cord, D, substantially as and for the purpose specified.

75,661.—PAPER FILE.—E. W. Woodruff and G. C. Green, Washington, D. C.

We claim, 1st, The clamp lever, D, provided with the lugs, F F G G, or their equivalents, combined with the base board, A, substantially as described so that no portion of said clamping device shall project below the lower surface of said base board when the apparatus is in operative condition.

2d, The clamp lever, D, or its equivalent, and the file board, E, combined and arranged so that the pressure derived from the elasticity of the paper shall always be applied to the upper end of said lever, substantially as set forth and to the effect described.

3d, Making the file board, E, or its equivlaent, separate from and independent of the clamping device for the purpose set forth.

4th, The side pieces, B B, in combination with the end and base boards and the clamping device of a paper file, substantially as set forth.

75,662.—DIE FOR MAKING HAMMERS.—Henry W. Bailey, (assignor to himself and wm. C. Bailey), Springfield, Mass.

I claim the combination of the punch, A, and die, B, herein described, when constructed and operating substantially as and for the purpose set forth.

75,663.—MACHINE FOR RIVETING HINGES.—H. D. Blake, (assignor to P. and F. Corbin), New Britain, Conn.

I claim a riveting tool, composed of a rod of metal, having V-shaped grooves crossing and radiating from its longitudinal axis across a face or end surface which is otherwise perpendicular to the axis of said rod, substantially as described.

Also, the riveting tool, set forth in the foregoing claim, in combination with mechanism for operating the same, arranged substantially as described.

75,664.—WINDOW FOR STOVE.—C. H. Buck, St. Louis, Mo.

I claim the combination of springs with glass plates which are applied to stove doors, substantially as described.

75,665.—COOKING STOVE.—G. Chilson, Boston, Mass.

I claim the arrangement of the water heater, the oven, and the jambs of the fireplace, the said jambs, under such arrangement, being between the oven and the heater, and the latter being at the jamb of the fireplace, as set forth.

Also, the combination and arrangement of the insulating air chamber and its door-opening, and the door or doors thereof, with the water heater, arranged in front of the fireplace in manner as explained.

75,666.—POWER ATTACHMENT TO SEWING MACHINES.—A. C. Crary, Utica, N. Y.

I claim the herein described mode of winding up the spring by the pressure of the operator on the seat.

75,667.—APPARATUS FOR OPERATING SEWING MACHINES.—A. C. Crary, Utica, N. Y.

I claim, 1st, The combination and arrangement of a series of springs and their connection for the purpose of propelling or operating sewing machines substantially as described.

2d, The application of motive power or force to the periphery or peripheries of concentric or coiled springs, or alternately to the peripheries of a series of springs, substantially as herein described, for the purpose of propelling or operating sewing machines, substantially as described.

3d, The mode or manner, substantially as herein described, of coiling or winding up concentric or coiled springs for the uses and purposes herein stated, by means of the treadle, or its equivalent, viz: the operator's rotating seat, the screw, the crank, and the lever.

4th, The mode, substantially as herein described, of constructing the operator's rotating seat and of its attachment, for the uses and purposes aforesaid.

75,668.—BRICK MACHINE.—R. Cutler, St. Louis, and G. C. Swallow, Columbia, Mo.

We claim the pug mill, B, when its bottom wings, b, are formed concavely on the bottom, and combined with a disk, C, and intermediate convex plate, as described and shown.

75,669.—CULTIVATOR TEETH.—J. D. De Turk, Exeter, Pa.

I claim the cap represented in figs. 1, 2, 3, and 4, intended to be fastened to the cultivator beam, into which the tooth is to be inserted, and fastened by the iron hinge bolt, a, figs. 1, 2, and 3, and the wooden pin or key at letter c, figs. 2 and 3, by the use of which the breaking of the tooth can be avoided.

75,670.—GLOBE VALVE.—F. Douglass, Norwich, Conn.

I claim, 1st, The arrangement of the flexible ring, C, to form a valve, when compressed between ring, A, and ring or valve, E, in such a manner as to expand ring, C, in diameter, to form a tight joint, substantially as specified.

2d, The arrangement of the metallic ring, A, with channels, l l, for the purpose herein specified,

75,671.—APPARATUS FOR LOWERING SHIPS' MASTS.—Geo. Dowling, Fair Haven, Conn.

I claim, 1st, The arrangement of the mast, A, upon the trunnions, a, and step, B, combined with a segmental track, C, and pawl, P, and toothed segment, d, so as to operate in the manner and for the purpose herein set forth.

2d, In combination with the above, the latch, f, arranged so as to lock the mast in an upright position, in the manner described.

75,672.—MUCILAGE BOTTLE.—Henry H. Ebaugh, Hereford, Md.

I claim a mucilage can or holder, with a fountain tube, B, in combination with a stoppered brush, constructed and operating substantially as and for the purposes herein specified.

75,673.—BROILER.—A. J. Gibson, Cincinnati, Ohio.

I claim the combination, in a broiling vessel, of non-perforated cones and corrugations, substantially as described.

75,674.—GRAIN PLATFORM FOR HARVESTERS.—A. E. Gleason, Newton, Mich.

I claim a reaping or mowing machine platform having perforations or interstices, in connection and combination with box compartments, F, provided with openings and doors, G and D, the whole constructed, attached, and supported substantially as and for the purpose herein specified.

75,675.—MACHINE FOR HEATING BOLTS.—A. B. Glover, Birmingham, Conn.

I claim, 1st, The combination of the cam, R, slide, O, and die, f, with the cam, T, auxiliary slide, U, screw-threaded follower, h, nuts, n n, all constructed and arranged as described.

2d, The supporting finger, b, in combination with the holding dies, F and E, when constructed and arranged so as to be presented and retire at the proper time, as and for the purpose set forth.

75,676.—MECHANICAL MOVEMENT.—Wm. F. Goodwin, East New York, N. Y.

I claim, 1st, The arrangement of two or more shafts in line with each other, one having a pivoted bearing in and operated by the other, substantially as described.

2d, The arrangement of the line shafts within the concentric internally cogged drum or case, substantially as described.

3d, The internally cogged drum, subdivided into separate compartments or provided with the bearing partitions for the line shafts, as described.

4th, The line shafts provided with spur wheels, or their equivalent, in combination with the internally cogged drum, substantially as described.

75,677.—HARVESTER.—William F. Goodwin, East New York, and A. M. Smith, Washington, D. C., assignors to William F. Goodwin.

We claim, 1st, The concentric arrangement of the multiplying gear relative to the crank shaft, or an extension of the axial line thereof, substantially as described.

2d, The location of the multiplying gear at the drooping end of the vibrating cutter frame and in line with the hinge connection of the cutting apparatus with said frame.

3d, The arrangement of the crank shaft upon the vibrating cutter frame in line with the shaft from which it receives its motion.

4th, The inclosing gear box or case having one or more central bearing partitions, for the purpose and substantially as described.

5th, The gear box or case provided with the two pivoted bearings at right angles to each other, substantially as described.

6th, The internally cogged drum or gear case arranged relative to and vibrating with the cutter frame, substantially as described.

7th, The cutter frame provided with the yoke to receive the gear box, or its equivalent, and with the case inclosing the bevel gears, substantially as described.

8th, The arrangement of the crank shaft and connecting rod, in the described relation to the two pivots, at right angles to each other, upon which the finger bar turns in accommodating itself to the surface of the ground over which it is drawn.

9th, The cap or case inclosing the outer end of the pitman, as described.

10th, The removable hooked tongue plate, adapted to be secured to or removed from the axle or sleeve, substantially as described.

75,678.—SAW MILL.—H. H. Gridley, Auburn, N. Y.

I claim, 1st, The combination of the lever, f, shaft, E, and its connecting links with the pivoted arm, B, carrying in a slot the adjustable box, with the friction shaft, d, and the adjustable stud of the tightening pulley, b, all constructed and operating substantially as described.

2d, The combination of the slide bar, r, with its springs, s, and the dogs, t, with the slide rack, l, substantially as and for the purpose described.

3d, The combination of the segment pinion, k, upon the end of the lever or arm of the automatic setting apparatus with the auxiliary rack under the sliding rack, l, substantially as and for the purposes described.

75,679.—MOP WRINGER.—James H. Gridley, Washington, D. C., assignor to S. F. Dickinson, New York city.

I claim, 1st, The combination of the pivoted boards or frames, C C1, with the connecting rod, D, in the manner and for the purpose set forth.

2d, In combination with the boards, C C1, rod, D, and spring, E, the rollers R R, substantially as and for the purpose specified.

3d, The above-described method of attaching the mop wringer to the tub, when in use, to prevent its slipping upon the tub, substantially as set forth

75,680.—WASHING MACHINE.—F. W. Heins, New York city

I claim as an improvement in washing machines, the body, A, whose bottom and ends are formed of a single sheet of metal, bent or stamped into continuous corrugations throughout its entire length, with the strengthen

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ing board, e, and bars, d, which sustain the gudgeons a, on which the body oscillates, substantially as and for the purpose described.

75,681.—MACHINE FOR SETTING AND DISTRIBUTING TYPE.—Wm. H. Houston, New York city.

I claim, 1st, The combination of the lifting plate, operated substantially as herein described, for lifting the types to be distributed, line by line, the galley on which the types to be distributed are placed, and on which they are advanced towards the lifting plate, the mechanism, or the equivalent thereof, by which the depressing mechanism is connected with the driving power so soon as a line of types has been delivered to the distributing mechanism, and disconnected so soon as another line is to be lifted, substantially as described.

2d, The projecting lip on the face of the lifting plate to draw down the leads, substantially as set forth, in combination with the sliding plate under the galley, substantially as described, to prevent the leads from dropping out before they are required to be delivered, as set forth.

3d, In combination with the projecting lip on the face of the lifting plate, the employment of a separate plate, which may be applied to or removed from the face of the lifting plate, and under the projecting lip, that the machine may be used for distributing either leaded or solid matter, substantially as described.

4th, The means herein described for separating the types of various thickness one by one from the line, and delivering them to be distributed, consisting of the combination of the channel way in which the line of types is moved, the check against which the foremost type of the line is moved, and which is caused to recede by intermittent motions, each of not greater range than the thickness of the thinnest type, and the reciprocating hammer, or its equivalent, which strikes a series of light blows against the foremost type, to feel when it can pass by the end of the channel-way, and finally moves far enough to deliver the type to the distributer, the said instruments being operated by the mechanisms described, or equivalents therefor, as set forth.

5th, The combs having a lateral reciprocating motion, substantially as described, in combination with the series of racks for the reception of the appropriate types, and the spring or self-adapting plungers and followers, which hold the types at each operation, whilst the combs are moved laterally, by means of which the types are shifted at each operation, and each type in turn presented to the several racks until it finds the one into which it can pass; the parts so claimed in combination being operated by the mechanical means herein described, or the equivalents thereof.

6th, The reciprocating comb plates, in combination with the clutch on the shaft from which the said motions are derived, the said combination being effected by the intermediate mechanism described, or the equivalent thereof, whereby the shaft is unclutched from the driving pulley and stopped, if by reason of any impediment the combs fail to complete their motion in either direction.

7th, In combination with the series of racks for receiving the types as distributed, and with apertures at their rear ends for their discharge into the case, the employment of a vibrating or reciprocating hammer to strike the types in case they should have a tendency to stick in the racks, substantially as described.

8th, The reciprocating plate, back of the apertures, in the racks through which the distributed types are delivered in the several compartments or channel-ways of the case, and which descends in front of the types after they have been pushed back to make room for the next types to be delivered, substantially as described, in combination with the clutch on the shaft from which the motions of the said plate are derived, whereby the said shaft will be unclutched from its driving pulley and stopped in case the said plate meets with any impediment, the said combination being effected by the mechanism hereinabove described, or any equivalent therefor.

9th, In the composing part of the machine herein described, the means, substantially as herein described, by which the keys when depressed merely indicate the type which is to be lifted from the case, in combination with the mechanism by which the types are lifted, substantially as described.

10th, The lifters for lifting the types from the case, substantially as described, in combination with the clutch on the shaft from which the lifters derive their motions, substantially as described, whereby the said shaft is unclutched from its driving pulley and stopped whenever any one of the lifters is stopped, so that it cannot complete its upward motion, the said combination being effected by the mechanism herein described, or by equivalent means.

11th, Giving a lifting motion to the plate which holds down the types in the case that are back of the foremost type in each channel-way, that they may not be drawn up by the type which is being lifted, substantially as described, the said motion being given to the said plate at the time of and to free the types when they are being advanced, as set forth.

12th, So constructing and arranging the self-adapting pressure plate, which constitutes one side of the passage in which the types are received from the case, and in which they are made to slide by the shuttles, that it shall vibrate on its longitudinal axis, substantially as and for the purpose described.

13th, The combination of the two reciprocating shuttles with the one channel-way or passage in which the types travel, substantially as described, the said shuttles being alternately lifted in their return motion, that the one which is returning may pass over or by the one which is advancing, as described.

14th, The means, substantially as herein described, by which the shaft which drives the composing mechanism is unclutched from its driving pulley, and stopped so soon as a line is completed, that the lines may not be overrun, as set forth.

15th, In combination with the shaft which drives the mechanism for transferring each line of type to the galley, the starting key and clutch, substantially as described, so that the operation of transferring each line is performed automatically, the operator being required simply to operate the said key.

75,682.—THILL STRAP.—Edward Howell (assignor to himself and P. C. Ford), Ashtabula, Ohio.

I claim the loop, C, connected with the spring, E, in combination with the pin, c, strap, A, and loops, a a, substantially as and for the purpose set forth.

75,683.—TIE STRAP.—Thomas S. Judson (assignor to himself and Henry A. Allen), Matteawan, N. Y.

I claim the combination with a hitching or halter strap, made of any ordinary or suitable material, of an elastic band or spring, applied to said strap, substantially in the manner and for the purposes herein shown and set forth.

75,684.—MACHINE FOR STRETCHING HAT BODY.—Peter Keefer (assignor to himself, William Levan, and Isaac W. Levan), Reading, Pa.

I claim the pivoted arms, l, to which a vertical reciprocating motion can be imparted, and which can be moved outwards by the action of the conical block, F, or its equivalent, in combination with the stationary pendent arms q, the said movable and stationary arms being arranged for joint action on a hat body, as and for the purpose herein set forth.

75,685.—COMBINED SWEAT BAND FASTENER AND SIZE MARK FOR HATS.—Thomas A. Lawrence, and John H. Murfey, New York city.

We claim, as an improved article of manufacture, a hat band fastener, A, provided with pointed projections, a a, and having the size of the hat stamped upon it, as described.

75,686.—HAY ELEVATOR.—Wm. Louden, Fairfield, Iowa.

I claim, 1st, The frame, B, provided with the slide, n, and pulley, g, in combination with the bar or track, A, and hoisting tackle, R, all arranged to operate substantially as set forth.

2d, The manner of supporting and sustaining the poles, H K, by means of a cord or rope, o, so that the poles composing the supporting frame, C, can be shifted without disarranging the position of the pulley, M, substantially as set forth.

3d, Passing the rope, J, which sustains the end of the bar, A, through the sheave, I, and securing it to one of the poles, as at T, substantially in the manner as and for the purpose set forth.

4th, The manner of adjusting two or more triangular pyramidal frames upon another frame, for transportation, wherein the base of one frame will extend into the space occupied by the frame adjacent, thus securing economy of space and rendering the apparatus compact, substantially as shown and set forth.

5th, The arrangement of the triple bolt, (fig. 4,) constructed substantially in the manner as and for the purpose set forth.

6th, The stop, S, constructed in the manner substantially as shown and described.

7th, The plate, P, when used in combination with a stop whose upper end has its corners rounded off, and has the rope passing through its center, all arranged substantially as shown and described.

8th, The arrangement of the trip-rod, m, with the latch, t, whereby when the former is pressed up, the latter will serve as its support, substantially as set forth.

75,687.—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—Alexander Mackey, New York city.

I claim, 1st, The guides, F F, and the wedge shaped pieces, T T, substantially as described.

2d, The perpendicular edge on lower or larger end of cone, substantially as described, for the purpose specified.

75,688.—CARRIAGE PERCH CONNECTION.—D A. Mathews, Geneva, N. Y., assignor to D. W. Baird.

I claim the T-piece, A, provided with screws and nuts, as described, and a fork or socket for the wooden perch, C; and, in combination with the T-piece above claimed, the brace, B, provided with an arm, K, and screw and nut, substantially as described, and for the purposes set forth.

Also, combining with the brace, B, the arms, I I, and ears or lugs, G G, substantially as shown and described, and for the purposes set forth; and, in combination with the T-piece, A, and brace, B, the brace, E, perforated for the bolt and screws, as described.

75,689.—CASE FOR HOLDING SYRINGE.—Morris Mattson, New York city.

I claim, as a new article of manufacture, a syringe-case, constructed substantially as described, with a removable tray, and having such tray recessed or cut away at or near one end, to allow the bulb of the syringe to pass up through the tray, and fitted at the other end with suitable rests or grooves to hold and keep separate from each other the several injecting tubes required.

75,690.—MANUFACTURE OF ARTIFICIAL LEATHER.—Harrison B. Meech, Fort Edward, N. Y.

I claim, 1st, as a new article of manufacture, leather made from fibrous substances as described.

2d, The application of gutta-percha, valatta, or balata, and other adhesive gums, and saccharine matter with pulp, for the manufacture of artificial leather, substantially as described.

3d, The method of applying the solutions of glue and other adhesive substances and saccharine matter to the sheets of pulp, as and for the purposes specified.

4th, The method of working, pressing, drying, and vulcanizing the leather, substantially as described.

5th, The use of oils, applied substantially as and for the purposes specified.

6th, The method of drying the leather, in combination with the oiling process, substantially as described.

7th, The use of sand or pulverized emery, in combination with the sheets of pulp, substantially as and for the purposes specified.

8th, The use of corrugated or grooved rolls, for the purpose of working the leather and rendering it soft and flexible, substantially as described.

9th, Forming the fibers of the pulp in the sheets into spirals, by the use of wire cloth, substantially as and for the purpose specified.

75,691.—BLEACHING PAPER STOCK.—S. T. Merrill, Beloit, Wis.

I claim the manipulation of paper stock (particularly wood and straw), in the bleaching fluids, without the use use of draining vats.

Also, the dessication of "stuff" and "half stuff," with rubber rolls, substantially as set forth.

75,692.—UMBRELLA.—Charles M. Minor, Bridgeport, and Henry S. Frost, Watertown, assignors to themselves, Augustus N. Woolson, and Anthony G. Davis, Watertown, Conn.

We claim, 1st, The construction of the loop upon the end of one of the parts of the rib, so as to receive and lock or brace the other part therein, substantially as set forth.

2d, The folding joint, consisting of the three parts, a b, and c, by means of the block i, two of the parts being jointed or pivoted, substantially as set forth.

75,693.—VAGINAL SYRINGE.—James A. Morrell, Chicago, Ill., assignor to himself and Isaac Simmons, Baltimore, Md.

I claim, 1st, A syringe, provided with an expansible air sack, susceptible of being introduced within the vagina, so as to expand against the interior walls of the passage, substantially in the manner and for the purposes specified.

2d, The combination of the reservoir, A, tube, B, and expansible sack, D, arranged so that the injected fluid may be withdrawn into the reservoir, substantially as specified and described.

3d, The combination of the tube, B, the sack, D, or its equivalent, the reservoir, A, and compressers, C, arranged to operate substantially in the manner set forth.

75,694.—UTERINE SUPPORTER.—James A. Morrell, Chicago, Ill., assignor to himself and Isaac Simmons, Baltimore, Md.

I claim, 1st, The combination of a pessary, A, tube, B, spring, C, tube, D, and rod, E, arranged and operating substantially as and for the purposes specified.

2d, Connecting the stem of a uterine supporter to the stem supporter, by a hinge or joint, so as to operate substantially as described.

3d, The combination of a pessary, A, and its stem, constructed substantially as described, with the jointed arm, F, and the elastic strap, H, arranged and operating in the manner and for the purposes specified.

75,695.—ABDOMINAL SUPPORTER.—James A. Morrell, Chicago, Ill., assignor to himself and Isaac Simmons, Baltimore, Md.

I claim, 1st, An abdominal supporter, having its front edges constructed in the curved form shown and described, for the purposes set forth.

2d, Providing an abdominal supporter with the front lower lacings, b b, or their equivalent, as and for the purposes described.

3d, An abdominal supporter, provided with the curved front edges, when constructed with the upper and lower front lacings, and the rear lacing, substantially as and for the purposes specified.

75,696.—RUDDER.—Thomas W. Murray, New York city.

I claim the shaft, A, formed with a crank upon its lower end, when used in combination with the rudder blade, C, to which it is connected at its outer edge by means of a pin or pivot, substantially as and for the purpose herein set forth.

75,697.—LAMP BURNER.—R. W. Park (assignor to C. W. Park), Philadelphia, Pa.

I claim, 1st, In combination with the dome of a coal oil lamp, two air tubes, channels, or orifices, arranged, in respect to the elongated slot of the dome, substantially as set forth.

2d, The combination of the perforated casing, A, plate, E, dome, D, and air tubes, a a, the whole being arranged substantially as described.

75,698.—THILL COUPLING.—George Pennoyer, N. Y. city.

I claim, 1st, The double solid cone, i in combination with the clip, fig. 1.

2d, The solid conic caps, A A, in combination with the solid cones

3d, The screw bolt, in the position and for the purposes described.

4th, The capped joint in constructing a carriage coupling, as and for the purposes described.

75,699.—BRACE FOR BIT.—F. P. Pfleghar, New Haven, Conn.

I claim the arrangement of the saddle, C, upon the socket, A, and combined with the nut, B, so that the saddle, C, may be turned from the bit, and the whole constructed so as to operate in the manner herein set forth.

75,700.—PRODUCTION OF PLATES FOR PRINTING.—James Ramage and Thomas Nelson, Edinburgh, Scotland. Patented in England March 26, 1866.

We claim the combined process herein described, for the production of blocks and plates for printing, such combined process consisting in acting on a film of gelatine rendered sensitive by a chromatic salt, with light passed through a positive or negative of the design required, then wetting the gelatine surface, so as to cause it to swell in parts, then coating the swollen surface with an impervious skin, afterward taking a cast from the surface so obtained; and, lastly, stereotyping or electrotyping the mold so obtained, substantially as herein described.

75,701.—METHOD OF SUPPLYING CATTLE WITH FOOD AND WATER ON RAILWAY CARS.—William Reid, Granton, North Britain.

I claim a stationary or detachable tank or trough, arranged upon a railway car so as to both extend into and project beyond the outer side of the same, substantially as and for the purpose described.

75,702.—SHOE LACE.—Lewis Rice, Stockbridge, Mich.

I claim, as an article of manufacture, the shoe-lacing device as described, and for the purposes set forth.

75,703.—TWEER.—John W. Rogers, Decatur, Ill.

I claim, 1st, The upper portion, A, of the tweer, constructed as described, and having the blast openings arranged therein substantially as set forth.

2d, The pot-shaped under portion of the tweer, having the weighted valves, j, arranged upon it, as and for the purpose herein described and represented.

75,704.—BELT FASTENING.—Eugene Schmeltz, New York city, assignor to himself and Paul E. Fleury.

I claim the improved mode of lacing together belts or bands, etc., substantially as herein described, the same consisting in passing a lacing, cord or cords, or other lines, from one to the other of the contact faces to the belt or band, etc., where overlapped, or partially through the thickness of the same, substantially as specified.

75,705.—COTTON BALE TIE.—J. L. Sheppard, Charleston, S.C.

I claim the cotton bale tie above described, consisting of the ring, a a a' a', having the sides, a a, straight and parallel, and the sides, a' a', curved, the central opening being of such a form as to enable the hoop to be inserted over the ends, a' a', and turned so as to rest upon the sides, a a, when such ring is used in connection with an arm, B, between which and the nearest side, a, is an open recess, c, all the said parts being constructed and arranged substantially in the manner and for the purpose specified.

75,706.—CONSTRUCTION OF SHEET METAL TEA AND COFFEE POTS.—John H. Stone, Philadelphia, Pa.

I claim a sheet metal tea or coffee pot, having the lower end, C D, of its body, and the upper side of its base, A B, formed up, and connected together at their smaller ends, so as to produce the said bottom and base, with the recessed portion, E F, between them as and for the purpose described.

Also in combination with the subject matter of the preceding claim, the strainer, G H I, constructed and applied substantially as described and set forth.

75,707.—CLOTHES WRINGER.—Wm. M. Storm, New York, city. Antedated March 10, 1868.

I claim constituting the roll or rolls of a series of inelastic annular disks, having an elastic bushing of india-rubber, or its equivalent, the whole mounted on a shaft or shafts and operating substantially in the manner and for the purpose described.

75,708.—WELL DRILL.—Henry M. Stow, San Francisco, Cal.

I claim in combination with a drill stock in two parts, as described, movable cutters, operated by wedge shaped tenons, to enlarge the hole formed by the drill, substantially as shown and described.

75,709.—MACHINE FOR GRINDING KNIVES OF HARVESTERS.—John A. Thompson (assignor to himself and L. W. Nye), Auburn, N. Y.

I claim, 1st, in combination with the movable base, F, pedestal, G, and tilting supporting bar, I, the elastic clamps, H H, with thumb screw and bolt, T, forming movable joints, for the purposes set forth.

2d, The connection of the supporting bar, I, by the toggle elbow joints, J J J, and bar, K.

3d, The hood guard, M, and the rotary guard, N, as and for the purposes specified.

4th, The thimble, O, and angular frame, E, all combined and operating in manner substantially as set forth and for the purposes specified.

75,710.—PROTECTOR FOR THE BODY.—Joseph W. Torrey (assignor to himself and John S. Johnston), Milford, Mass.

I claim the new article of manufacture described, to wit, a breast and back protector, consisting of a cloth bag or case lined or filled with paper, substantially as described.

75,711.—CARRIAGE THILL.—Jas. P. Tyson, Philadelphia, Pa.

I claim a tapering strip, C, of gum-elastic or its equivalent, secured at one end to the bar, B, and extending between the end of the latter and the coupling block, substantially as and for the purpose described.

75,712.—FAGOT FOR BEAMS.—George Walters and Thomas Shaffer, Phœnixville, Pa.

We claim a pile or fagot, for wrought iron beams or girders, consisting of a solid bar or bars, A, having a rib, a, gripped by and between bars, b and b', secured by transverse rivets to intervening bars, which are, together, less in thickness than the said rib, a, all as set forth, for the purpose specified.

75,713.—TIRE SETTING MACHINE.—Robert B. Wheatley, Grandview, Ind.

I claim the device of the screw bolt, n, passing through at rotating in the eye bolt, y, which, being firmly fastened to the crab, allows the wheel to be revolved in the water, with the crab for a support, during the process of cooling the tire, and so as to govern completely the dish of the wheel more readily than if the work were performed with the wheel and crab in the usual horizontal position, or if the wheel were left without any support whatever.

75,714.—PISTON.—Jerome Wheelock, Worcester, Mass.

I claim the ring A, when the same is provided with a wedge-shaped cavity, and corresponding piece fitted into the same, in combination with the strap, C, and screws, d e, substantially as shown and described.

75,715.—COAL STOVE.—Charles Williams, Manchester, N. H.

I claim the combination of the flue plate, I, the flue, c, the case, A, the stand pipe, B, and the air and smoke box, C, with the rebated posts, E, the cap, D, the series of soapstone panels, F G H, and the lap plates, M, the whole constituting a stove, substantially as set forth.

75,716.—DENTAL FORCEPS.—Samuel Wolverton, Trenton, N. J., assignor to himself, George L. Taylor, and Lewis Parker, Jr.

I claim dental molar forceps, when provided with horn and crescent beak combined, substantially as described and for the purpose set forth.

75,717.—SPRINKLER.—W. R. Worden, New Haven, Conn.

I claim the arrangement of the plate, B, with its arms, b, upon the plate, A, with its perforations corresponding to the said arms, and combined with one or more operating rods, D, and return spring, a, the whole to operate in the manner substantially as set forth.

REISSUES.

2,897.—WASHING MACHINE.—Wm. M. Doty, New York city. Patented July 12, 1864.

I claim, 1st, The combination of the oscillating wash board and swinging brackets with a removable hand lever or levers, operating in the manner substantially as herein shown and described.

2d, The formation, in swinging brackets, to which the corrugated wash board is attached, of sockets, or the mechanical equivalents thereof, for the ready insertion and removal of the operating lever, substantially as and for the purposes herein shown and described.

3d, The combination with an oscillatory washboard and stationary washtub, of the means herein shown and described, or the mechanical equivalent thereof for rendering the said washboard stationary within the tub, at the pleasure of the operator.

2,898.—GLOBE VALVE.—Joseph J. French and Reuben A. McCauley, Baltimore, Md., assignees of Joseph J. French. Patented July 2, 1857.

We claim in a globe valve composed of the body, A, solid support, H, carrying at its apex the hollow screw, B, and lever, A', with plug to stuffing box, F, the parts all made and arranged substantially as shown and described.

2,899.—MACHINE FOR MITERING PRINTERS' RULE.—R. Hoe & Co. (assignees of Wm. McDonald), New York city. Patented July 3, 1855.

We claim the combination with a movable cutter, of a secter guide plate, a rule holding bed, and adjusting mechanism, constructed and operating substantially as described and for the purposes specified.

2,900.—CROSS HEAD FOR BLOWERS.—P. H. Roots and F. M. Roots, Connersville, Ind. Patented July 24, 1866.

We claim a piston constructed of cross heads, A, fastened to a shaft, B, in combination with wooden lags or pieces, C, which compose the covering of the piston, and are secured to the cross heads substantially as and for the purpose set forth.

DESIGNS.

2,951.—LAMP SHADE.—Charles Binzer, New York city.

2,952.—EXTERIOR OF THE BODY OF A SLEIGH.—Charles P. Kimball, Portland, Me.

2,953.—COOK STOVE.—John Martino, Jacob Beesley, and John Currie, Philadelphia, Pa., assignors to Orr, Painter & Co., Reading, Pa.

2,954.—HANDLE OF A FORK OR SPOON.—John Polhamus, New York city.

2,955, 2,956, and 2,957.—FLOOR OILCLOTH PATTERN.—Joseph Robley, Brooklyn, N. Y.

2,958.—PLATES OF A HOP STOVE.—Nicholas S. Vedder, Troy, N. Y., assignor to George Williamson & Co., Milwaukee, Wis.

2,959.—CLOCK CASE SASH.—E. N. Welch, Forestville, Conn.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., 37 *Park Row, N. Y.*

[ISSUED FOR WEEK ENDING TUESDAY, MARCH 10, 1868.]

11,505.—DOCUMENT FILE OR HOLDER.—Henry E. Woodbury, Washington, D. C. Dated August 8, 1854. Application for reissue received and filed March 3, 1868.

I claim the box or compartment document file, provided with a yielding platen constructed and operating substantially as herein described.

72,086.—FENCE POST.—Robert Ramsey, New Wilmington, Pa. Dated December 10, 1867. Application for reissue received and filed March 5, 1868.

I claim, 1st, The compensating features of the posts, whether effected by the formation of the gains or by keys, substantially as and for the purpose set forth.

2d, The combination of posts, P P' P'', when provided with square or dovetail gains, with sills, A A', and keys, e e' e, substantially as and for the purpose specified.

45,647.—PUMP.—William Shoupe, Saltsburg, Pa. Dated December 27, 1864. Antedated April 26, 1862. Application for reissue received and filed March 5, 1868.

I claim, 1st, The tube c, in artesian or deep wells, in combination with the seed bag, placed around and outside of it, so arranged, substantially as herein before described, as to leave a free passage for and around the pump tube, while the space around the outer tube is closed by the seed bag, for the purpose hereinbefore set forth.

2d, The combination, with a pump tube, A, of the outer tube, C, with or without a valve or gate, D, and a seed bag, placed around and outside of the outer tube, substantially as hereinbefore described, for the purpose set forth.

3d, The gate, or valve, D, in the outer tube, C, for the purpose of admitting water into the pipe, C, from outside of the tube, above the seed bag, substantially as described.

71,893.—COMPOSITION OF MATTER FOR THE MANUFACTURE OF WATERPROOF PAPER AND OTHER ARTICLES.—R. O. Lowrey, Salem, N. Y. Dated December 10, 1867. Application for reissue received and March 2, 1868.

I claim, 1st, The use of salt, in combination with any of the salts of alumina, or similar astringent material for rendering a gelatinous compound or mixture, insoluble in water, substantially as described.

2d, The use of salt, in combination with the salts of alumina, or similar astringent material for rendering soapy compounds or mixtures insoluble in water, substantially as and for the purposes set forth.

3d, The use of alum or any of the salts of alumina, for rendering a soapy compound insoluble in water, when said soapy compound has been previously incorporated with paper pulp or fiber, substantially as described.

4th, The use of glycerin, in combination with a gelatinous or soapy compound, when applied to fibrous materials, substantially as set forth.

5th, The new compound or composition of matter, produced by the treatment of fibrous material, substantially as herein described.

6th, The process herein described, of treating fibrous material for producing a new compound, substantially as described.

14,257.—REFINING IRON.—Christian Shunk, Philadelphia, Pa. Dated February 12, 1856. Reissue No. 1,686. Dated May 31, 1864. Reissue No. 2,118. Dated November 28, 1865. Application for reissue received and filed March 10, 1868.

I claim, 1st, The refining and converting molten crude iron from the ores or the remelted pig metal, by the employment and the application of air blast under pressure forced into a mass of molten iron, so that the oxygen of the air uniting with the carbon of the crude metal, and thereby decarbonizing and partially decarbonizing (owing to the time the blast is continued) and refining the same, prepared to mold into ingots or otherwise of iron and steel, suited for the hammer or the rolls; also into any form, and condition for the purpose of employing the said refined iron and steel (by air blast) in the "crucible process" to make cast steel.

2d, And the employment of manganese and common salt, in the manufacture of refined iron and steel, by the process of compressed air blast forced into molten crude iron, for the purpose of refining and decarbonizing the same, to mold into ingots or otherwise; or either of said ingredients employed separately in said process for the manufacture of iron or steel.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of* 30 *days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* *MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y.*

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[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

217.—ROTARY, STEAM, AND OTHER ENGINES.—John M. Boorman, Scarborough, N. Y. Jan. 21, 1868.

296.—PAVEMENT.—Clarendon Williams and Thomas Stephens, New York city. Jan. 28, 1868.

319.—FURNACES OR OVENS FOR ROASTING ORES.—Riley P. Wilson, New York city. Jan. 29, 1868.

329.—WINDOW SUN BLINDS.—Jacob B. Moore, New York city. Jan. 30, 1868.

337.—STEAM ENGINE.—Edward N. Dickerson, New York city. Jan. 31, 1868.

357.—STEAM AND WATER VALVES, COCKS, AND FAUCETS.—Henry G. Morris, Philadelphia, Pa. Feb. 3, 1868.

367.—LEGGINGS OR GAITERS, ETC.—Wm. G. Rule, New York city. Feb. 3, 1868.

394.—MOWING AND REAPING MACHINES.—John D. Wilber, Mark D. Wilber, and Francis K. Stevens, Poughkeepsie, N. Y. Feb. 5, 1868.

353.—APPARATUS FOR MANUFACTURING, STORING, AND TRANSFERRING AERATED WATERS, ETC.—Gustavus D. Dows, Boston, Mass. Feb. 1, 1868.

371.—TREATMENT OF COMPRESSED OR EMBOSSED WOOD.—Samuel B. Henry, Bridgeport, Conn. Feb. 4, 1868.

446.—MACHINE FOR SCOURING AND CLEANING GRAIN.—Gardner E. Throop, Syracuse, N. Y. Feb. 10, 1868.

467.—APPARATUS FOR SAVING LIFE IN CASES OF SHIPWRECK.—John B Stoner, Leopold Mendelson, and Theodore Crommelin, New York city Feb. 11, 1868.

477.—REVOLVING STANDS FOR CULINARY PURPOSES.—Charles H. Hudson, New York city, Feb. 12, 1867.

478.—CARTRIDGE BOXES OR HOLDERS.—John W. Cochran, New York city. Feb. 12, 1868.

493.—MODE OF AND APPARATUS FOR EXTRACTING AND CONDENSING THE VOLATILE PORTIONS OF ORES.—Ferdinand Formhals, San Francisco, Cal. Feb 13, 1868.

494.—WHIP HOLDER.—Daniel Talcott, New York city. Feb. 13, 1868.

496.—COMPOUND OF ANILINE COLORS.—Emil Zinssmann, New York city Feb. 14, 1868.

519.—BREECH-LOADING FIRE-ARMS AND CARTRIDGES.—Benj. B. Hotchk New York. Feb. 17, 1868.

522.—LAMP BURNER.—Wm. Lincoln, Boston, Mass. Feb. 17 1868.

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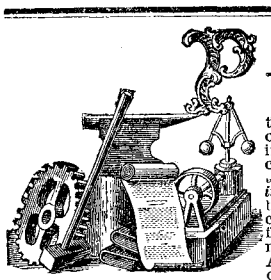

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